AMERICAN ANTIQUITY

VOL. III JANUARY, 1938 NO. 3

EDITORIALS

PROFESSIONAL AND AMATEUR INTERESTS . . . The essential purpose of archaeology is that of augmenting our knowledge of man, his arts and institutions, and his history. This purpose may and often does have its origin in an interest which finds initial expression in the collecting of artifacts. As a matter of fact, the science of archaeology has developed from just such a beginning, and is repeatedly reborn in the minds of collectors who sincerely seek the answers to questions which even a casual examination of artifacts in the average collection will suggest. Thus, an interest in artifacts, prompting a search for information regarding their fabrication and use, leads to a desire to know more of the men who made and used them; and this desire, opportunity permitting, may lead the collector to become a student of archaeology and, broadening out, of the general subject of anthropology.

The specialist who may be inclined to doubt the contributive value of properly motivated student artifact collectors invites the accusation of both a deficiency in experience from adequate and correct contacts with collectors, and a sad short-sightedness relative to the past history and future development of his science. Historically, a majority of the founders of an early contributors to the study of archaeology, the world over, were amateur collectors; a fact paralleled in the history of all other sciences in which specimens comprise an important element of data. The future welfare of American archaeology depends largely upon encouraging in every way a full coöperation between the relatively few professional specialists and a constantly growing element of both collecting and non-collecting amateur students.

To cite a single example of the importance amateurs can assume in the development of a science, geology, a subject in which a most profitable coöperation between professionals and amateurs has long existed, lists among those who were originally amateur collectors the names of such outstanding contributors to the science as C. D. Walcott, E. W. Berry, E. O. Ulrich, Frank Springer, and many others who have attained to exalted places in the professional ranks. An imposing list

of such men could be gathered from the names of those responsible for the development of European archaeology.

The informed student-collector may be the means of saving for study materials and data that, save for the fortunate intervention of the collector, might become separated and forever lost to all students. The value of his collection depends upon the established accuracy of facts as to sources and associations known for his specimens. Therefore, he should be as much the exponent of careful, technically accurate field and laboratory research as is the non-collecting student. The extent of his usefulness to archaeology will depend upon the development of his interests and the guiding light of information made available to him through the coöperation of other students. As regards ultimate purpose and a jealous desire to preserve all available information, and to protect informational sources from careless excavation at the hands of untrained men, or wanton destruction by those motivated by casual curiosity or commercial interest, there can be no logical difference in attitude between one class of sincere students and another.

This society is founded on the faith that there is in this country a rapidly increasing number of non-professional students of archaeology who, given the friendly assistance of the trained specialist, are in a position to promote the welfare of the subject in various important ways: through correctly collecting and recording materials and data which otherwise would be dissociated and lost; by bringing to the attention of specialists local discoveries; by contributing to archaeological surveys of surface features; by assimilating and disseminating the gospel of true problems and correct methods; and by building up a strong popular foundation in support of scientifically correct archaeological investigations.

I, for one, am satisfied that this faith is not misplaced. If my appraisal of the average amateur is correct, it behooves the trained professional, in consideration of his own best interests, to get down off the driver's seat and pull with his brother students toward the common goal, exerting his corrective influence through logical demonstration rather than through any fancied authority vested in him because of his academic training or professional status.

I believe that I express the opinion and the policy of a majority of the professional group in the statement that both professionals and amateurs have much to gain and nothing to lose from friendly, sympathetic coöperation.

W. C. M.

UNDESIRABLE PROFICIENCY . . . A communication recently received by the Milwaukee Public Museum from a dealer in "genuine prehistoric Indian relics" contains the boast that he is one of the few, if not the only dealer who digs mounds and camp sites on a large scale to produce his stock in trade, and that, therefore, he offers to his clients a money-back guarantee of the authenticity of his wares. A newspaper account accompanying the letter conclusively establishes the inferior technique and unscientific viewpoint characterizing these excavations.

It is your editor's earnest hope that this gentleman *is* the only and the *last* dealer to obtain prehistoric American Indian "relics" in this manner—although I know better. Not that I have any desire to deprive the collector of a guarantee of authenticity, whatever that may be worth to a specimen without the addition of carefully collected associated data, but because, as a sincere student of American archaeology, it must be my purpose, and that of all similarly sincere students, to foster the careful collecting of archaeological materials and associated facts at the hands of trained specialists, and the protection of archaeological sites from the careless digging of untrained men whose interests are primarily commercial and whose methods are wholly unscientific.

The collector should, in self protection, always bear in mind that the scientific value of his materials is wholly dependent upon the quantity and accuracy of information pertinent to and collected with the specimens.

W. C. M.

OBSERVATIONS ON THE PRESENT STATUS AND PROBLEMS OF MIDDLE AMERICAN ARCHAEOLOGY, *PART I*[134]

J. ALDEN MASON[135]

THE ARCHAEOLOGICAL knowledge of practically every large area suffers from unevenness. The lure of the spectacular and the overemphasis on the higher aspects result in concentration of interests on a few regions, while other parts remain practically unknown scientifically. In few regions is this more true than in Middle America. To the average person without special interests all Mexican archaeological phenomena are Aztec, just as all South American ones are Inca. Even many sites in the United States have been popularly ascribed to the Aztecs, as for instance the site of Aztec in New Mexico and Aztalan in Wisconsin. Contritely we must confess that similarly some professional archaeologists seem to see little in Middle America but the Maya and their influences. Specialists, and special studies, we must have, and the Maya area, the Valley of Mexico, and several other regions are of such exceptional interest and importance that specialists in many fields, in stratigraphical archaeology, architecture, epigraphy, art, ceramics, and other phases, may with reason devote themselves exclusively to these fields and these topics. But we must ever keep in mind that these are but specialized high developments, and that for a true understanding of the cultures of this great area and of their prehistory, inter-influences, and migrations, we must have as complete a knowledge as possible of every corner of the land.

Though our knowledge of even these higher centers is still most incomplete, it is immense as compared with that of the rest of the area. Of the archaeology of a great part of Mexico and Central America we still know practically nothing. We sometimes traverse archaeologically unknown areas en route to the centers of higher culture without stopping to investigate, with the subconscious feeling that "there is no archaeology here." There is archaeology everywhere, and a sherd or projectile point picked up in an out-of-the-way place means more scientifically than a beautiful ceramic vessel of a well-known type; a stratigraphical sequence, more than an artistic sculpture. Unfortunately none of us is wholly immune to the satisfaction that comes from finding an art object.

[134] In two parts, the second to appear in the following (April) number.

[135] University Museum, University of Pennsylvania, Philadelphia.

Problems of diffusion should not be decided exclusively on archaeological grounds. Archaeologists are inclined to reach conclusions on such bases without considering the evidence of the other anthropological disciplines, such as physical anthropology and linguistics, and sometimes hypotheses are advanced which are untenable on somatological and linguistic grounds. While a small band might migrate without leaving any linguistic or physical trace, any tribal migration could hardly avoid it. Present linguistic resemblances argue for a common origin or close relationship, and the closer the connection in language, presumably the later the separation or diffusion. The fact that the Nahua are the southernmost members of the great Uto-Aztecan linguistic stock tends to corroborate their tradition that they came from the north, though this does not necessarily mean the United States, and any archaeological theory that would propose a more southerly origin for the Nahua would be untenable.

One should exercise great caution in guarding against the tendency to associate archaeological cultures in a given area with its present or most recent inhabitants. Just as, until relatively recent years, all objects from the Valley of Mexico were considered as "Aztec," so even today we often speak of Huaxtec, Tarascan, Totonac, Zapotec, Mayan, Chorotegan and other cultures without much certainty that the ancient peoples of the region in question were the predecessors and ancestors of the present or recent peoples of that name. There have been great changes in populations, conquests, and migrations in the past, and such terms should not be given finality until the developmental sequence has been established.

Let us take stock as to the extent of our knowledge of the archaeology of the various regions of Middle America.

Northern Mexico. Our knowledge of the archaeology of Mexico is pretty well confined to the southern third or two-fifths, roughly south of a line from Tampico to Guadalajara. To the south were the more densely settled regions with their higher cultures; to the north, the less settled areas and the less advanced peoples. Low in culture though most of this latter region may be, it holds the keys by means of which to clarify the mutual inter-influences and migrations of peoples and of culture traits between the higher cultures of southern Mexico on one hand, and those of the Pueblo and "Mound-builder" regions on the other. That cultural elements, and possibly even people themselves, either entire ethnic groups or bands of travelers or traders, did thus migrate from time to time is strongly indicated. We must guard against the all-too-common assump-

tion, however, that traits common to the two regions are *ipso facto* influences from Mexico; some diffusions may have traveled in the opposite direction, and a few common traits may be independent developments. Another tendency that must be combated is that of some archaeologists in the United States, unfamiliar with details of Mexican archaeology, to ascribe to Mexico or Mexican influence all high-grade extraneous or exotic features that they encounter. Thus, among the elements that have been mentioned as indicating Mexican influence in the Mound region are monolithic axes and long ceremonial swords of chipped flint, both of which are less common in Mexico than in the United States. We should always be certain of our background before suggesting such conclusions.

The question of relations between Mexico and the United States is one of the most important ones of North American archaeology, but not enough work has been done in either region on questions of historical sequences and culture horizons to permit this question to be answered as yet. We must know much more about the relative ages of certain culture elements both in the United States and in Mexico before we can suggest hypotheses that will hold water; the temporal stymie is sometimes ignored in archaeological theories. Certain common elements may be those of a very old, fundamental, more or less uniform background; others, such as possibly agriculture and pottery, are probably of a very ancient gradual diffusion; others are more recent, and some may be the result of a single fortuitous contact with a band of traders or warriors. Common features that are in themselves a combination of elements not necessarily related greatly increase the argument for diffusion; one example of this may be the eagle-men on shell gorgets from the southeastern United States mounds.[126]

We might divide northern Mexico into the following provinces: Lower California, the West Coast, the Western Mountains and their easterly foothills, the East, the Atlantic Coast. All these differ archaeologically as well as geographically and ecologically.

The archaeology of Lower California is practically unknown; it is one of the regions where archaeology might with most reason be said to be missing. It is a very arid, poorly watered region, and the recent aborigines were non-agricultural, of a low cultural stage. Late horizons are probably very unimportant but the region may be important from the standpoint of the earliest horizons. It may have been better watered

[126] Moorehead, 1932; Nuttall, 1932; Spinden, 1931.

at the close of the glacial period, and the long seacoast doubtless provides a large food-supply. Shellmounds are frequent and should be investigated. It is especially important since it is a natural cul-de-sac to the southern tip of which earlier peoples would have been driven by later waves. That this actually occurred is strongly suggested by the physical remains, ascribed to the extinct Pericu, which are said to show an archaic physical type with Australoid tendencies.[137] Archaeological investigations in this region would be unspectacular but of great scientific value.

Several expeditions, especially from Californian institutions, have resulted in the publishing of archaeological notes incidentally collected in the course of other investigations,[138] but Dr. Jorge Engerrand[139] is almost the only one who has done archaeological work in this region in recent years. He investigated the northern parts and published upon the petroglyphs, shell implements, and pseudo-eoliths.

The Pacific Coast north of the region of Tepic remained a terra incognita until recent years when the Ibero-Americana group at the University of California began their important work there.[140] Their researches have shown that peoples of high culture may have populated this coast for a long distance north. Excavations near Culiacan and near Mazatlan in Sinaloa have revealed cultures of a very high grade, especially as evidenced by their ceramics. The ware is highly polychrome and has its closest analogies with pottery types from much farther south, such as the Valley of Mexico, Oaxaca, and apparently even Costa Rica and Nicaragua. Strange to say there seems to be little resemblance to the Tarascan, the nearest of the high cultures to the south. Apparently a tongue of high civilization extended up the coast, having no contact with the geographically nearer cultures of the other side of the neighboring mountains.[141] There seems to be no connection whatever with the Pueblo region of the American Southwest.

The stratigraphical sequences of the few careful excavations in this region by Dr. Isabel Kelly[142] were carefully determined, but before they

[137] Ten Kate, 1884. For logical arguments against this hypothesis, see Hrdlička, 1935.

[138] Brand, 1935.

[139] Engerrand, 1912, 1913.

[140] Twelve numbers of the Ibero-Americana series have been issued to date, of which all but one refer to Mexico, and almost all of these to the archaeology and ethnology of northern Mexico. See especially Sauer and Brand, 1932.

[141] Mason, 1935–1937; II, 2, 152.

[142] Results not yet published. See Mason, 1935–1937, II, 2, 151, 152.

can be tied up with other cultures and made significant, equally careful investigations must be made in the less known coastal areas to north and south. It is presumed that the link will eventually be made with cultures related to Toltec, and on that horizon.

Probably these cultures with polychrome pottery of a high type did not extend far north of Culiacan; no trace of them has been reported in Sonora. The coast of Sonora is absolutely unknown, though Amsden,[143] Brand,[144] and Bandelier[145] have made reconnaissances in the interior.

The consensus of all investigators is that a definite gap exists in far northern Mexico between the northernmost archaeological cultures that are basically Mexican and the southernmost that are of southwestern United States cultural affinity; neither shows much if any influence from the other and there seems to be no transitional or intermediate zone. On the west coast the limit of Mexican influence seems to be near the Sinaloa River in Sinaloa; that of Southwest influence, near the Sonora River in Sonora. This gap seems to extend eastward across the mountains and the eastern foothills to the non-agricultural arid eastern region.[146]

Some of the phases of the southwestern United States Pueblo culture extended south of the international border, but how far south is yet to be determined. The mountains of northern Chihuahua contain many "cliff-houses" and cave-dwellings superficially resembling those of Arizona and New Mexico. Lumholtz[147] noted many up to one hundred fifty miles south of the border, but he does not mention them south of there, though the modern Tarahumara occupy practically all the inhabitable caves and build rude structures in them. Not impossibly the Tarahumara may be the descendants of the "cliff-dwellers" in this region. Bennett and Zingg made excavations in many caves and their results, as yet unpublished, may throw considerable light on the continuity and sequences of occupation. So far, to my knowledge, no careful excavation has been done in any of the better-preserved cliff-houses, and a collection of potsherds, together with beam-sections for dendrochronological determination, would doubtless permit cultural and chronological hook-ups with well-determined phases of Pueblo culture in our southwestern states. In the mountains of Durango, Mason and

[143] Amsden, 1928.
[144] Brand, 1935.
[145] Bandelier, 1892.
[146] Brand, 1935; Beals, 1932.
[147] Lumholtz, 1902.

Merrill heard no reports of ancient cave-structures, except in the region of Mezquital, south of Durango City. These masonry ruins, as well as the skeletal remains, were reported to be so small as to indicate a pygmy race; presumably they were granaries, and with no close connection with the true cave-dwellings of Puebloan affiliation much farther north.

In the eastern foothills, some hundred miles south of the border, is the interesting archaeological zone of Casas Grandes, the southernmost extension of the Pueblo culture in this region. This culture is related to that of Mimbres in southern New Mexico and shows no obvious Mexican influence. The architecture, of puddled adobe, indicates a connection with the Casa Grande ruin of the lower Gila Valley, Arizona, but no traces were found at Casas Grandes of the Hohokam, probably the earliest agricultural but non-Pueblo people of the Southwest. The archaeological problems of southern Arizona and the northern part of Chihuahua are being carefully studied, especially by Gila Pueblo of Globe, Arizona,[148] but they are not germane to our topic, as apparently the influence was almost exclusively from the north, and they fall in the Southwestern Culture Area. Whatever Mexican influences there are were probably carried by the Hohokam, the early population of the Papagueria, careful studies on whom have been but recently inaugurated.[149]

In several respects, however, features are found in this region which extend far south into Mexico. Thus in the Casas Grandes area, while most of the better buildings are made with walls of adobe or stone, many sites are merely elevated rectangles formed by small boulders or slabs deeply interred and projecting but slightly above the ground; the buildings themselves were presumably built of perishable materials. This is the type of house-site found along the eastern foothills of the mountains from here south to Jalisco. Apparently in the Casas Grandes area these sites belong to the same culture as those with adobe or masonry walls, features which are not again found, to my knowledge, north of the state of Zacatecas. The ceramics found in these sites of rather similar external nature vary greatly, from the purely Puebloan pottery of Casas Grandes through the Mexicanoid pottery of Zape to the typical Mexican ceramics of Hervideros and Villa Amaro in Durango,[150] but throughout this region the grooved or three-quarter-grooved stone ax is employed

[148] The Medallion Papers, of which twenty-four have to date been published.
[149] Roberts, 1937.
[150] Mason, 1937.

in place of the ungrooved ax of the higher Mexican cultures to the south, and copper bells, small pendant stone animal effigies, and small but massive sculptures of animals and human beings are found, suggesting some basic cultural unity. The metates, manos, bowls, and other stone utensils resemble those of the United States Southwest probably even more than they do those of southern Mexico.

The question of the origin of the Puebloan cultures and of their relationships with Mexico must be intimately related with that of the Hohokam peoples, the apparent earliest sedentary population of southern Arizona and the probable ancestors of the present Pima and Papago. As these latter are the northernmost members of the Piman linguistic group, the other members of which (the Nevome, Tepehuan, and Tepecano) extend, in isolated groups and with remarkably little linguistic variation, over a thousand miles down the mountains to Jalisco, the hypothesis of a common origin and relatively recent and possibly rapid dispersion is strongly indicated. It has proved impossible so far to trace the origin of the Hohokam beyond their known habitat in any direction, but it is not unlikely that their forebears will eventually be found some distance south in the Mexican mountains.

It is in the eastern foothills of the cordillera that cultures of Mexican aspect reached their northernmost extension. The climate was favorable for this; the water-supply is more ample than in regions further east. Sayles distinguishes, on a ceramic basis, several cultural phases in the Casas Grandes region, the oldest and most extensive of which, the Medanos, has a southern limit extending nearly to the northern boundary of the state of Durango; he notices no Mexican influence in the pottery of this phase [151] At Zape, Durango, only one hundred miles farther south, Mason noted no obvious Puebloan traits.[152] Apparently these two peripheral sites mark the limits of influence from north and south. They may not be contemporaneous, however, and probably are not, but there is no evidence that this gap between the northern and southern cultures was ever occupied by either.

The cultures of the eastern foothills from near Guadalajara north to Zape are but slightly known. Not even a general term has been adopted for them. Here and there, at considerable distances apart, are major sites such as La Quemada and Chalchihuites in Zacatecas, and Spinden[153] has applied the term "Frontier cities of the Northwest" to them.

[151] Sayles, 1936.
[152] Mason, 1937.
[153] Spinden, 1928.

As one proceeds northward the degree of culture becomes poorer and more attenuated, but persists basically Mexican even at Zape. The archaeology of even these foci is but slightly known, and that of the intervening regions is almost unknown. Probably, as in other parts of Mexico, it will eventually be divided into a number of minor culture areas, with sequential chronological phases each of a different geographical distribution, but researches are still too few and superficial to permit even the hazard of a guess. The connections are with the south, and the major phases probably on the Toltec horizon, though probably somewhat later owing to the dispersional lag inherent in all peripheral regions. There must be a close historical relationship also with the Tarascan culture of Michoacan and Jalisco. The resemblances are basic rather than detailed, however, and each region has its specific types of artifacts, especially of pottery. That of La Quemada[154] is not well known, but includes the peculiar cloisonné ware which is also found in other sites to the southwest of La Quemada, such as Totoate[155] and Estanzuela.[156] It is also found at Chalchihuites, farther north, and occasionally in Toltec sites in the Valley of Mexico, but is not quantitatively common at any site. The distribution and limits of this type of ware should be significant and of chronological value; they should be investigated. La Quemada[157] has often been associated with the perigrinations of the Aztecs, but there is no scientific basis for this; it has the appearance of being primarily a fortress, and was probably a bulwark against the encroachments of nomadic non-agricultural peoples on the east, possibly the Apache irruption. The pottery of Chalchihuites is mainly of a characteristic red-on-buff ware which seems to have a considerable area of distribution, at least to the north.[158] The ceramics at Zape seem to be a debased form of Chalchihuites which is, consequently, the northernmost in this region.[159] On the whole this is one of the most unknown and fertile fields for important scientific archaeological research in Mexico.

The great eastern plateau region, largely owing to its aridity, was mainly non-agricultural. A wide belt of territory, sparsely populated in

[154] Noguera, 1930.
[155] Hrdlička, 1903.
[156] Lumholtz, 1902.
[157] Noguera, 1930; Batres, 1903; Seler, 1908; Garcia, 1927; Hrdlička, 1903; Tarayre, 1869.
[158] Gamio, 1910; Noguera, 1930; Mason, 1937.
[159] Mason, 1937.

Conquest times by nomadic or hunting peoples, ran due south through Texas to the state of Aguas Calientes, and reached the sea in southern Texas. No high culture could have existed here in recent times, nor is it reasonable that much, if any influence between north and south crossed it. Artifacts of a low grade are found; pottery is not mentioned by the earliest chroniclers as having been made by any of the tribes, which are now entirely extinct. However, it is in such regions that perishable artifacts are best preserved, and excavations in a few caves here have produced excellent textiles and other objects.[160] More extensive cave work in this region should reveal sites as interesting and important as those of the Texas Big Bend area, probably occupations on the Basket Maker horizon, and possibly even earlier on the Folsom horizon, at which time the region may have been better watered; the pleistocene palaeontological fauna is quite rich.

Coming to the Atlantic seaboard, on account of the more humid littoral conditions, the intensive agricultural area extends farther north, almost to the mouth of the Rio Grande; but between here and the mound region of eastern Texas several hundred miles of non-agricultural territory intervene, occupied in recent years by the Tonkawa, Karankawa, and Coahuiltecan tribes, most of whom had practically no dependence on agriculture.[161] The archaeology of this intervening area is most important, for through here presumably passed any possible influences or migrations between eastern Mexico and the cultures of the Mississippi drainage. Such relationships seem highly probable, especially between the ancient Caddoan peoples of eastern Texas and Arkansas and a basic pre-Maya influence from Central America tentatively termed the "Q Complex."[162] The resemblances in ceramic forms and in certain other artifacts are so close that some connection is indicated. It is probably of some significance that the Caddoan peoples, including the Caddo and Pawnee, were the most agricultural and sedentary peoples of the Plains, that some elements in Pawnee religion are very similar to others of Highland Mexico, and that Sapir, in his tentative regrouping of North American Indian languages,[163] suggests that possibly Mayan may belong to the Hokan-Siouan group, of which Caddoan is another member. However, these resemblances must not be taken at face value; at the best they present fertile and intriguing

[160] Studley, 1887.
[161] Beals, 1932.
[162] Vaillant, 1932.
[163] Sapir, 1929.

fields for research that may prove of the greatest importance. Each must be examined on its own merits and the temporal element taken into consideration. For instance, the linguistic differences are such that the hypothetical separation must have taken place at a very ancient period, while the resemblances in religion noted have their closest connections with the late-horizon Aztec.

On the coast of Texas, in this non-agricultural gap between the Huaxtec region and the Caddoan mounds, is found pottery of a relatively high type which shows some resemblance to the Huaxtec,[164] and through here the influence or migration from the south presumably passed.

The Huaxtecs of southern Tamaulipas, northern Vera Cruz, and parts of San Luis Potosi are an interesting people whose archaeology should be better known, as they occupy a key position of importance as the northernmost group of high culture on the Gulf Coast. Their language is related to the Maya but their culture was quite different from that of the classic Maya of Guatemala and Yucatan; it is presumptive that they separated from the major group before the latter developed their peculiar civilization. Huaxtec remains, and especially the oldest remains, should be compared with the oldest remains in the Maya region, and even a superficial examination into this reveals considerable resemblance to the group of ceramic characteristics termed the "Q Complex."[165] The pottery is mainly a creamy buff, and in this it closely resembles the ceramics of the Pacific coast of Guatemala generally ascribed to the Nahuan Pipil. The general Huaxtec type of pottery and other artifacts is relatively well known from objects in various collections,[166] but little of this has been secured by scientific excavation,[167] and more careful research is needed in this region not only to increase our knowledge of the culture of the ancient Huaxtecs themselves but for the light it may shed on the relationships between the Q-Complex and the Caddoans.

Many of the above remarks apply also to the people just south of the Huaxtecs in the state of Vera Cruz, the Totonacs.[168] Whether their language also is related to the Maya is still undetermined, but this generally accepted suggestion has at any rate not been disproved; it is

[164] Mason, 1935.
[165] Vaillant, 1932.
[166] Seler, 1916; Fewkes, 1907b.
[167] Staub, 1921.
[168] Krickeberg, 1918–1925.

much more different from the typical Maya than is that of the Huaxtecs who are more peripheral. The archaeology, however, is rather closely related to that of the early Maya, and especially to that of the Pacific Coast of Guatemala. Many types of ceremonial carved stone objects, such as yokes and thin profile faces, are almost identical in these two regions.[169] In the Totonac region in particular these are among the finest examples of American stone carving; they probably belong to one of the later horizons, probably the Toltec. A good deal is known of the ceramic types in the Totonac archaeological region,[170] but there have been few careful excavations and much remains yet to be elucidated.

One of the less well known but most important cultures in Mexico is that of the Tarascan in Michoacan. It occupies a key position as the northwesternmost of the important higher cultures, most important as a link between the Valley of Mexico and the northwestern "frontier" cultures. We shall have to know much more of the Tarascans before we shall have a clear picture of the north of Mexico. Carefully done excavations are almost unknown in this region and we know practically nothing of cultural sequences. Large collections illustrating "Tarascan" archaeology exist in many museums, and the typical characteristics are known, but these may consist of objects from many different horizons and minor phases of culture which must eventually be distinguished. In stone implements the Tarascan objects show some similarities with the far north of Mexico and even with the United States Pueblo region. In ceramics the figurines and effigy vessels present a close resemblance to the art of the Archaic cultures of the Valley of Mexico; grotesque, with eyes showing stylistic peculiarities. It is therefore one hypothesis that the peoples of the Archaic cultures were of Tarascan blood; this remains for future verification.[171]

While the present Tarascan Indians are restricted to the state of Michoacan, ceramics of quite similar types are found to the west and north in Jalisco, Colima and Nayarit. This territory was, at the time of earliest report, occupied by natives of Nahuan or Aztec tongue, but it is likely that this occupation was very recent as a result of Aztec conquest, if not immediately after the Spanish conquest. The cultural background was probably little affected.

The archaeology of the states of Guanajuato, Queretaro and Hidalgo to the north of Mexico City is very slightly known. Parts were occupied

[169] Fewkes, 1907b.
[170] Strebel, 1885–1889; Nuttall, 1910.
[171] Noguera, 1935.

by certain phases of the Tarascan, Toltec and Aztec cultures,[172] but the larger part was and is inhabited by the Otomi Indians, to whom a relatively low stage of culture has always been ascribed, without any ruins of importance or artifacts of artistic merit. Largely for this reason the archaeology of the Otomi region has been neglected. The Otomi, however, have been traditionally considered one of the oldest nations in Mexico, and were apparently autochthonous in their region, undisturbed by migrations and ignoring imperial conquests. They have been compared by some with the Chinese; even to the extent of considering their strange tongue related to Chinese; the latter has no scientific backing, but an examination of the archaeology of their region, while unspectacular, should prove most important scientifically. Their territory extended far to the north, even farther in the highlands than that of the more littoral Huaxtec.

A few years ago the Mexican Government discovered ruins of an interesting new phase of Tarascan culture at Chupicuaro, Guanajuato, and there must be many other sites, each with a slightly unique culture and locally peculiar types of ceramics and other artifacts.

The most extensive and intensive stratigraphical work ever done in Middle America is undoubtedly that of Dr. and Mrs. Vaillant, of the American Museum of Natural History, in the Valley of Mexico. The first division into the three main sequential periods of Archaic or "Type of the Hills," Toltec or Teotihuacan, and Aztec, was determined by Boas[173] and Gamio.[174] Kroeber[175] later divided the Archaic into four main sub-types, and the major part of the work of the Vaillants[176] since 1928 has also been concerned with the Archaic phases, though in the last few years they have also investigated the later Toltec and Aztec periods, as well as the Chichimec that intervened between the latter two. All these researches tend in the main to corroborate the Aztec legends concerning the later periods. An old native custom affords data by which these later periods may be accurately dated. At the close of each calendar-round of fifty-two years all household and temple equipment was destroyed and replaced. Vaillant believes that he has identified the large "dumps" for six of these epochal hecatombs. He distinguishes four main Aztec periods to which certain ceramic styles can

[172] Noguera, 1932.
[173] Boas, 1911.
[174] Gamio, 1921.
[175] Kroeber, 1925.
[176] Vaillant, 1935b, 1937. A very full bibliography in the former.

be assigned. Pyramids were also enlarged at these terminal periods, and the pyramid of Tenayuca shows seven such stages. Chronologically this takes us back over three centuries from the Cortesian period, a century before the founding of Mexico City according to tradition, and close to the time of the legendary arrival of the Aztecs in the Valley of Mexico. The stratigraphical evidence indicates that a period of heterogeneity preceded this, with many local styles; it overlapped the early Aztec on one end and the late Toltec on the other. This agrees well with the legendary Chichimec period of migrations and settlements. The Mazapan and Coyotlatelco types of pottery characterize this period.

The Toltecs of the Aztec legends are now accepted as a historical entity, despite Brinton,[177] and are identified with the builders and occupants of the great site of Teotihuacan.[178] Their period of dominion was longer than that of the Aztecs, and overlapped both the early Chichimec period and the later phases of the earlier Archaic period. Four sub-phases are distinguished. Many problems of Toltec archaeology still await elucidation, especially their temporal and cultural relationships with the Maya and the other higher peoples of southern Mexico.

The most important branch of highland Mexican archaeology concerns the Archaic peoples. Due to the researches of the Vaillants the sequential relations, with their ceramic characteristics, are now clear. Two epochs are distinguished, the Zacatenco-Copilco, and the Ticoman-Cuicuilco, each divided into three main periods. That the Archaic residence here was a long one is indicated by the fourteen meters of deposit in places, but Vaillant believes six hundred years sufficient. The absolute age is also obviously considerable, since burials are found beneath a lava flow (Copilco), and a large pyramid (Cuicuilco) was partially engulfed by the lava. If geologists could date this eruption the time of these phases of the Archaic could be fixed, but unfortunately there are no criteria for dating such "recent" geological phenomena; two thousand years is about the minimum period estimated. This would place the earliest known phases of the Archaic at about the beginning of the Christian era, a date that is also indicated on stratigraphical evidence, and would correlate the period with the later phases of the Basket Maker culture of our southwestern states, according to the best modern authorities. The antiquity is thus not so great as at first believed.

---

[177] Brinton, 1887.
[178] Gamio, 1922.

While we thus know much concerning the Archaic peoples in the Valley of Mexico, the larger problems that they involve, especially the important questions of the origin of Middle American higher cultures, still await solution. Though the Archaic was probably the oldest known high culture in this region, this was far from primitive, and probably on a par with that of the modern Pueblo peoples; behind the Archaic lay a long period of development. Apparently no agricultural pottery-making peoples preceded them in this region, but their culture is too sophisticated even in its earliest stage to be that of a people evolving *in situ* from non-agricultural tribes. The earlier [179] hypothesis that they were the inventors of agriculture and of pottery, were of Nahua linguistic affinities, and carried a wide-spread "Archaic culture" throughout Middle America and even to northern South America is no longer accepted. The obvious deduction is that they were immigrants to the Valley of Mexico and that the roots of their culture are to be found elsewhere. The closest resemblances in the ceramics are to be found with those of the Tarascan peoples of Michoacan and Jalisco, and Noguera[180] therefore sensibly concludes that the Archaic peoples were probably of Tarascan linguistic and cultural affinities.

We need to correlate the Archaic cultures with historic and recent ethnic groups and languages. The distribution zones of the various ceramic types must be determined and the relations of the Archaic cultures with those of the Southwestern United States and the other early peoples of Mexico and Central America. Above all we need to search for the pre-Archaic peoples who presumably were the inventors of agriculture and pottery.

From time to time very unusual and exotic objects, sometimes of indubitable Asiatic origin, turn up in Mexico. Unfortunately these are almost always "found" by the laborers for non-professional archaeologists, and the suspicion of a "plant" is natural. None has ever been found, to my knowledge, unquestionably *in situ* in an excavation. Nevertheless we must keep an open mind on the question of possible diffusion from the Old World. The landing of occasional wayfarers from Asia or the Pacific Islands on the coast of Mexico in pre-Cortesian days is a distinct probability; how much influence they would have had is problematical.

South of Mexico City the great states of Oaxaca and Guerrero form one of the most fertile fields for archaeological research. Here were the

[179] Spinden, 1928.
[180] Noguera, 1935.

very highly advanced Zapotec and Mixtec, as well as others but little lower; not only are there very large and well-known sites, such as Monte Alban and Mitla,[181] but the country is filled with ruins of lesser importance. Guerrero is almost a terra incognita though new sites are constantly reported, and a large and most interesting collection was secured years ago by Frederick Starr at Taxco. The Mixtec had a very high culture at the time of the Conquest, evidently closely related to or greatly affected by the Toltec and Aztec. Many of the Mexican books or codices that have been preserved are supposed to have been Mixtec, and the extraordinary tombs found a few years ago by Caso[182] at Monte Alban are believed by him to have been Mixtec. Careful stratigraphical excavations in the Mixtec area should shed much needed light on the question of relationships between the Toltec, Zapotec and Maya. The region of the Mixes of the Isthmus of Tehuantepec is rarely visited even by Mexican officials, and these Indians still live in a practically aboriginal state; the archaeology of their country is almost absolutely unknown.

Research in the Zapotec region of Oaxaca has been pursued more intensively, especially at Monte Alban, in recent years, and as a result mainly of these latter we can now begin to distinguish periods, architectural and sculptural development, and types of ceramics and other artifacts characteristic of several periods.[183] The surface has hardly yet been scratched, however, and further careful researches in this area are urgently needed. The Zapotec culture is apparently very old and probably autochthonous. The region lies between the Valley of Mexico and Guatemala, and doubtless received influences from both, as well as contributing something to Toltec, Mixtec, and Maya cultures, and we shall have to know much more about the earlier phases of Zapotec civilization before we can clearly understand the mutual influences and the temporal relationships of Maya and Toltec. The Zapotecs had a hieroglyphic system, not so well developed as that of the Maya, but apparently containing elements of both the Mayan and Aztec systems. Little research has been done upon these hieroglyphs to date.

REFERENCES CITED

AMSDEN, MONROE

1928. Archaeological Reconnaissance in Sonora. Southwest Museum Papers 8, Los Angeles.

[181] Holmes, 1897; Caso, 1935, 1936; Batres, 1902.

[182] Caso, 1932.

[183] Caso, 1935, 1936.

BANDELIER, A. F.
1892. Final Report of Investigations among the Indians of the Southwestern United States. Archaeological Institute of America, American Series 4, Cambridge, Massachusetts.

BATRES, LEOPOLDO
1902. Explorations of Monte Alban. Inspección y Conservación de Monumentos Arqueológicos de la República de Mexico, Mexico.
1903. Visita a los Monumentos Arqueológicos de La Quemada. Mexico.

BEALS, RALPH L.
1932. The Comparative Ethnology of Northern Mexico before 1750. Ibero-Americana 2, Berkeley, California.

BOAS, FRANZ
1911. Album de Colecciones Arqueológicas; Plates. Publicaciones de la Escuela Internacional de Arqueología y Etnología Americanas, Mexico. (See Gamio, 1921.)

BRAND, DONALD R.
1935. The Distribution of Pottery Types in Northwest Mexico. Amer. Anthrop., N. S., Vol. 37: 287–305.

BRINTON, DANIEL G.
1887. Were the Toltecs an Historical Nationality? American Philosophical Society, Philadelphia.

CASO, ALFONSO
1932. Monte Alban, Richest Archaeological Find in America. National Geographic Magazine 62: 487–512.
1935. Las Exploraciones en Monte Alban. Instituto Panamericano de Geografía e Historia 18, Mexico.

CASO, ALFONSO and DE LA BORBOLLA, D. F. RUBIN
1936. Exploraciones en Mitla. Instituto Panamericano de Geografía e Historia 21, Tacubaya.

ENGERRAND, JORGE
1912a. Nuevos Petroglifos de la Baja California. Boletín del Museo Nacional 1, No. 10: 1–8, Mexico.
1912b. Nota Complimentaria acerca de los Petroglifos de la Baja California. *Id.* 2, No. 1: 1–5.
1913. Estado Actual de la Cuestión de los Eolitos. *Id.* 2, No. 8: 149–160.

FEWKES, J. WALTER
1907. Certain Antiquities of Eastern Mexico. Bur. Amer. Ethn., 25th Ann. Rept., Washington.

GAMIO, MANUEL
1910. Los Monumentos Arqueológicos de las Inmediaciones de Chalchihuites, Zacatecas. Anales del Museo Nacional de Arqueología 2: 467–492, Mexico.
1921. Album de Colecciones Arqueológicas; Texto. Publicaciones de la Escuela Internacional de Arqueología y Etnología Americanas, Mexico. (See Boas, 1911.)
1922. La Población del Valle de Teotihuacán. Secretaría de Agricultura y Fomento, Dirección de Antropología, Mexico.

GARCIA, AGUSTIN
1927. Informe sobre las Ruinas de La Quemada. Boletín de la Sec. de Educ. Pub. 6, No. 4, Mexico.

HOLMES, W. H.
1897. Archeological Studies among the Ancient Cities of Mexico, 2. Field Museum of Natural History, Anthropological Series 1, No. 1, Chicago.
HRDLIČKA, ALEŠ
1903. The "Chichimecs" and Their Ancient Culture, with Notes on the Tepecanos and the Ruin of La Quemada, Mexico. Amer. Anthrop., N. S., Vol. 5: 385–440.
KRICKEBERG, W.
1918–1925. Die Totonaken. Baessler Archiv 7: 1–55; 9: 1–75, Berlin.
KROEBER, A. L.
1925. Archaic Culture Horizons in the Valley of Mexico. Univ. of California Publ. in Amer. Ethnol. 17: 373–408.
LUMHOLTZ, CARL
1902. Unknown Mexico. New York.
MASON, J. ALDEN
1935. The Place of Texas in PreColumbian Relationships between the United States and Mexico. Texas Archaeol. and Paleon. Soc., Bull. 7, Abilene, Texas.
1935–1937. Reports on current archaeological work in Middle America. Amer. Antiquity 1–3.
1937. Late Archaeological Sites in Durango, Mexico; from Chalchihiites to Zape. Philadelphia Anthrop. Soc., 25th Ann. Studies, Philadelphia.
MOOREHEAD, WARREN K.
1932. Etowah Papers 1. Phillips Academy, Department of Anthropology, Andover, Massachusetts.
NOGUERA, EDUARDO
1930. Ruinas Arqueológicas del Norte de Mexico. Publ. de la Sec. de Educ. Pub., Dirección de Monumentos Prehispánicos, Mexico.
1932. Extensiones Cronológico-Culturales y Geográficas de las Cerámicas de Mexico. 25th Internat. Cong. Amer., Mexico.
1935. Antecedentes y Relaciones de la Cultura Teotihuacana. El Mexico Antiguo 3: 5–8, Mexico.
NUTTALL, ZELIA
1910. The Island of Sacrificios. Amer. Anthrop., N. S., Vol. 12: 257–292.
1932. Comparison between Etowan, Mexican and Mayan Designs. In Moorehead, 1932.
ROBERTS, F. H. H., Jr.
1937. Archaeology in the Southwest. Amer. Antiquity 3, No. 1: 3–33.
SAPIR, EDWARD
1929. Central and North American Indian Languages. In Encyclopaedia Britannica, 14th Edition.
SAUER, CARL and BRAND, DONALD
1932. Aztatlan; Prehistoric Mexican Frontier on the Pacific Coast. Ibero-Americana 1, Berkeley, California.
SAYLES, E. B.
1936. An Archaeological Survey of Chihuahua, Mexico. Gila Pueblo, Medallion Papers 22, Globe, Arizona.
SELER, CAECILIE
1916. Die Huaxteca-Sammlung des Kgl. Museums für Völkerkunde. Baessler Archiv 5: 98–136.

SELER, EDUARD
1908. Die Ruinen von La Quemada im Staate Zacatecas. Gesammelte Abhandlungen 3: 545–559.
SPINDEN, H. J.
1928. Ancient Civilizations of Mexico and Central America. Amer. Mus. Nat. Hist., Handbook Series 3 (third edition), New York.
1931. Indian Symbolism. Exposition of Indian Tribal Arts, New York.
STAUB, WALTER
1921. Pre-Hispanic Mortuary Pottery, Sherd Deposits and other Antiquities of the Huaxteca. El Mexico Antiguo 1: 218–237, Mexico.
STREBEL, H.
1885–1889. Alt Mexiko. Hamburg und Leipzig.
STUDLEY, CORNELIA
1887. Notes upon Human Remains from Caves in Coahuila. Peabody Museum of Harvard, Reports 3: 233–259, Cambridge, Massachusetts.
TARAVRE, GUILLEMIN
1869. Exploration Minéralogique des Régions Mexicaines. Paris.
TEN KATE, H.
1884. Materiaux pour Servir a l'Anthropologie de la Presq'ile Californienne. Bull. de la Soc. d'Anthrop. de Paris 3, No. 7: 551–569, Paris.
VAILLANT, GEORGE C.
1932. Some Resemblances in the Ceramics of Central and North America. Gila Pueblo, Medallion Papers 12, Globe, Arizona.
1935. Early Cultures of the Valley of Mexico. Amer. Mus. Nat. Hist., Anthrop. Papers 35, No. 3: 281–328, New York.
1937. History and Stratigraphy in the Valley of Mexico. Scientific Monthly 44: 307–324.

THE COMPARISON OF FIBER PROPERTIES OF ARIZONA CLIFF-DWELLER AND HOPI COTTON

EMIL W. HAURY[184] AND CARL M. CONRAD[185]

THE COTTON sample used in the following fiber study was found in the summer of 1932, in the Canyon Creek ruin, Fort Apache Indian Reservation, in east-central Arizona. During the excavations[186] remnants of cotton fabrics were frequently found in the rubbish, indicating that the occupants of the pueblo evidently made considerable use of the fiber. A small quantity of raw cotton, in the process of being spun into yarn, was found with an adult female buried below the floor of a room. From this it may rightfully be inferred that spinning and weaving were locally practiced; but the absence of cotton seeds and plant parts in the refuse of the dwelling, and the nature of the immediate environment made it appear that at least the fiber, and probably some fabrics ready woven, were imported from neighboring and more favorable areas.

The raw cotton was contained in a perfectly preserved twilled basket (Plate 7, Figure 1) along with the fully equipped spinning shaft. Fortunately the unspun end of the yarn is still attached to the fiber supply, giving us a clear-cut picture of the process. Spun yarn was wound on the spinning shaft below the wooden whorl.[187] Spinning kits duplicating this may still be seen in those modern pueblos where the art of weaving has not died out.

Other objects placed with the woman at the time of burial were a skein of fiber yarn of Apocynum (dog bane), and vessels of pottery and gourds. On the body were found a cord skirt and sandals, and before burial it was wrapped in a plain cotton blanket. The grave was covered with a large twilled mat weighted down by rocks.

The cotton fibers examined herein were taken from the basket illustrated. The age of the sample is of importance both to botanists and archaeologists. The roof of the room in which the burial was found was

[184] Department of Anthropology, University of Arizona, Tucson, Arizona.

[185] Senior Cotton Technologist, Division of Cotton Marketing, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

[186] By Gila Pueblo, Globe, Arizona.

[187] This spinning assemblage was previously illustrated in a report on the work in the ruin: Haury, E. W., 1934, The Canyon Creek Ruin and the Cliff Dwellings of the Sierra Ancha, Medallion Papers XIV, Gila Pueblo, Globe, Arizona; and the results of a preliminary examination of the cotton by Dr. R. S. Hawkins, University of Arizona, Tucson, Arizona, were presented therein.

nearly intact, and thus there were available several beams for tree-ring dating. The date for one of these was determined as 1340. The range of construction dates from the various rooms of the ruin was from 1326 to 1348, demonstrating a rather short construction period for the sixty-room pueblo. It may be supposed, in the light of the above dates, that the burial was made some time after 1340, but probably not much after 1348 when building activity had ceased and the pueblo was probably abandoned. Basing our judgment on these dates and on the character of the objects with which the cotton was associated, it may be placed unequivocally in the 14th century, and must therefore be regarded as the product of native Americans.

The Canyon Creek ruin is one of many to be found in cliff recesses in the Mogollon Rim area, built by a southern branch of the Pueblo culture during the 13th and 14th centuries.

Since a knowledge of the origin of this cotton is of special interest not only from the standpoint of archaeology, but also from the botanical standpoint, a comparison between its properties and those of the so-called Hopi cotton, grown by the Hopi Indians in the same region at the present time, seemed especially desirable. A portion of the lint was sent[188] to the Cotton Fiber Laboratory of the Bureau of Agricultural Economics where fiber measurements had already been made on several Hopi samples. The results of the fiber measurements are shown in the accompanying table (p. 226), and were all carried out in the same manner, except as indicated at the bottom of the table.

As can be seen from the table, considerable variation occurred in the same properties for the several Hopi samples. Since only three of these have been tested and results from only the one Cliff-Dweller sample are available, the degree of natural or seasonal variation of the fiber properties is not known. The fibers of the Cliff-Dweller cotton are appreciably longer than the average of those from the three Hopi samples. The upper quartile length of the former is 0.14 inch (over $\frac{1}{8}$ inch) and the mean length 0.15 inch (nearly 5/32 inch) longer than the corresponding measures of the latter. It is well known that fiber length is influenced by the moisture content of the soil during the period of boll development,[189]

[188] Through cooperation of T. H. Kearney, principal physiologist, in charge, Egyptian Cotton Breeding Investigation, Bureau of Plant Industry, U. S. D. A.

[189] A Study of Some Factors Affecting Lint Development of Cotton, D. G. Sturkie, 42nd Ann. Report, Ala. Agr. Expt. Sta., 1931, p. 18; Some Observations on the Relation of Lint Length to Rainfall, R. E. Kelsick, West Ind. Bull., 17:79–82, 1920; The Effects of Fertilizers and Rainfall on the Length of Cotton Fiber, E. B. Reynolds and D. T. Killough, J. Amer. Soc. Agr., 25:756–764, 1933.

but the differences have generally been less than those here observed.

The other properties of the Cliff-Dweller sample deviate in their values relatively slightly and insignificantly from the corresponding averages of the Hopi samples, with the exception of percentage of immature fibers and bundle strength. The percentage of immature fibers

FIBER PROPERTIES OF THREE SAMPLES OF HOPI COTTON AND OF THE CLIFF-DWELLER SAMPLE

	Hopi samples				Cliff-Dweller sample	Deviations of Cliff-Dweller samples
	a 1934	b 1934	c 1935	Average		
Upper quartile length[190], ins.	0.90	0.94	0.94	0.93	1.07	− 0.14
Mean length, ins.	0.78	0.82	0.82	0.79	0.94	− 0.15
Coef. of length variation, pct.	24.8	20.0	22.3	22.4	21.3	− 1.1
Fiber fineness, 10^{-4} mgs. per in.	43.5	40.7	38.7	41.0	42.5	− 1.5
Fiber per cross section 22s yarn	156.8	167.6	176.2	166.9	160.4	− 6.5
Var. of fiber fineness with length, pct.	7.0	8.5	15.0	10.2	11.7	− 1.5
Immature fibers, pct.	22.5[191]	23.8[191]	26.3	24.2	44.9	−20.7
Var. immature fibers with length, pct.	25.7	29.3	27.0	27.3	18.2	− 9.1
Bundle strength, 10^3 lbs. per sq. in.	[192]	94.0[193]	91.0	92.5	72.6	−19.9

in the Cliff-Dweller sample is much above the average for the Hopi samples, but this is a property known to be materially affected by growth conditions, especially conditions of drought[194] during boll development. While the strength of the fiber is some 21 percent below the average for two of the Hopi samples, it is by no means certain that it might not have been equal in its original condition. It is still above what might be expected in American upland cotton of the same fiber fineness

[190] Length at the 25 percent point on the length-cumulative weight percent curve, reading from the longest fibers.

[191] Data converted to common basis of technic by factor 1.8.

[192] No breaks could be obtained due to shortness and strength of fibers.

[193] Only one break could be obtained due to shortness and strength of fibers.

[194] Methods of Estimating Cotton Fiber Maturity, R. S. Hawkins, J. Agr. Research, 43(8):733–742, 1931; Tests on Samples of Cottons Grown with Different Applications of Water, Nazir Ahmad, Ann. Report Indian Central Cotton Comm., 1932, p. 53.

and length.[195] In fact, it is most surprising that a sample nearly 600 years old has not lost nearly all of its strength, and exceptionally good conditions for preservation must be assumed to explain the remarkable degree of retention of this property.

Still another fact not immediately evident from the fiber data is that both the Cliff-Dweller and the Hopi fibers are much finer than has usually been observed in American upland cotton of the same fiber length. Based on a rather close relationship between fineness and upper quartile length in several hundred American upland samples, the Hopi fibers are on the average about 30 percent lighter per unit of length, while the Cliff-Dweller fibers are about 19 percent lighter per unit of length than the average for the American upland cottons. The high percentage of immature fibers in the Cliff-Dweller sample may be partly responsible for the relatively low weight per unit of length, but the difference, even after making allowance for this, is still considerable.

These data indicate that the Cliff-Dweller sample probably represents a variety of cotton closely related to the modern Hopi. The high percentages of immature fibers would indicate that the plants from which the Cliff-Dweller sample was obtained had developed under adverse weather conditions. Although considerable present evidence points to drought as a causal factor in the production of a high percentage of undeveloped or "immature" fibers, it is not impossible that an unusually wet season might also result in poor growing conditions and a high proportion of such fibers. The latter kind of season would best explain the appreciably greater fiber length in the Cliff-Dweller cotton as compared with the Hopi samples.

[195] Based on a theoretical equation relating the strength of over 125 American upland cottons to their fiber fineness and length.

URN-BURIAL IN CENTRAL ALABAMA

PETER A. BRANNON[196]

THE CUSTOM of burying the dead in earthenware vessels, or more briefly, urn-burial, was widely distributed throughout the world. Before the coming of the Europeans the Indians living in what is now the state of Alabama practiced this custom extensively, for records of urn-burial exist from a number of archaeological sites in central Alabama along the Alabama and Tombigbee rivers and their tributaries. For many years there have been reports of the finding of human bones in pots by farmers during plowing or while examining recently eroded banks of streams. In 1884 Dr. Edward Palmer made a report upon such finds to the Smithsonian Institution.

The first comprehensive statements concerning aboriginal urn-burials in Alabama were the results of explorations carried on by Clarence B. Moore along the Alabama River in 1899, 1901, and 1904. His reports were published in Volumes XI, XII, and XIII of the Proceedings of the Philadelphia Academy of Natural Sciences. Since the establishment of the Alabama Anthropological Society[197] in Montgomery in 1909, its members have devoted a major part of their studies to the investigation of sites containing urn-burials.

Five of the many localities in which urn-burials have been found are referred to frequently in this paper. These are (1) Taskigi in Elmore County; (2) Pintlala Creek in Lowndes County; (3) Durant's Bend in Dallas County; (4) Muklassa in Elmore County; and (5) Huith-le-walli on the Tallapoosa River.

The site of Taskigi is near the mouths of the Coosa and the Tallapoosa rivers where they join to form the Alabama. In 1714, when the French established Fort Toulouse here, the two rivers approached to within 400 yards of one another, then diverged and came together four miles to the west. In 1886 the Tallapoosa cut across this 400 yard stretch during a flood and now enters the Coosa River just west of the mound of historic Taskigi town. This site has been under cultivation since 1818. Urn-burials, which are found just to the east of the historic mound, were first reported in the winter of 1928 when a farmer plowed into a burial, crushing the urn and knocking the bottom out of the cover vessel.

[196] Alabama Anthropological Society, Montgomery, Alabama.

[197] This paper is based upon information secured from the notes and material which several members of the Alabama Anthropological Society, especially Dr. R. P. Burke, have placed at the disposal of the author.

FIG. 1—Basket, cotton, and spinning shaft from Canyon Creek ruin, Arizona.

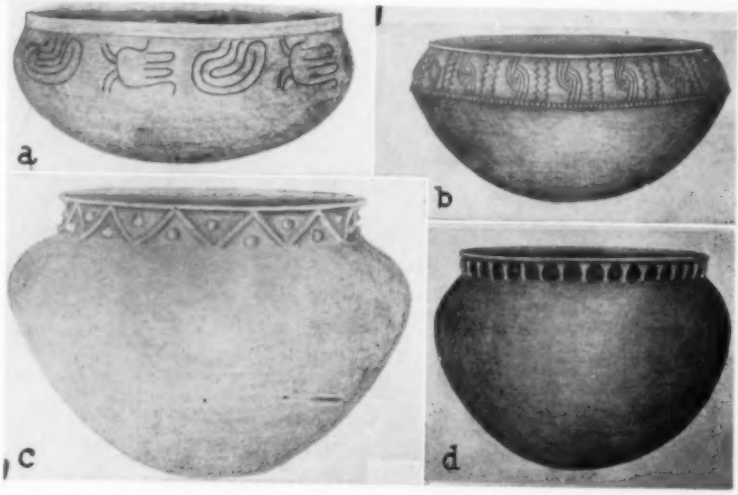


FIG. 2—a–b: Urn covers from mouth of Coosa River; c–d: characteristic urns from mouth of Coosa River, Alabama.

1

2

3

FIG. 1—Effigy from Pintlala Creek. The vessel, (the hole is in back of head) accompanying the remains of a baby, holds less than 4 ounces.

FIG. 2—Urn and cover from Mouth of Coosa River; diameter, over 22 inches.

FIG. 3—Urn cover from mouth of Coosa River; diameter at rim, 15 inches.

The site of Pintlala covers about ten acres on a high bluff along the Alabama River, just south of the mouth of Pintlala Creek. This locality has been under cultivation since before 1860. Dr. Palmer's notes state that bones in pots were plowed up here several years prior to 1884. The author first visited the site in 1909 upon receiving word that urn-burials were falling into the river from the sides of an eroded bank. Some years later, members of the Alabama Anthropological Society discovered additional burials on Pintlala Creek about one-half mile above its mouth, and south of the Alabama River. This nearby site has been named "Upper Pintlala." The soil erosion at Pintlala between 1909 and 1925 was so severe that practically the entire surface soil was washed away.

The third site, Durant's Bend on the Alabama River, in Dallas County, was visited by Clarence B. Moore and is reported upon in his publications. This site has been under cultivation since about 1790. It is said that here the high water of 1886 washed out many burials and some urns.

The fourth site lies on the Seth Johnson plantation north of the Tallapoosa River in Elmore County. This area is referred to in the early documents as Mukalassa, from which is obtained the term used in this paper, namely, Muklassa.

Urn-burials were found at the fifth site in 1929 by farmers, who uncovered a small burial urn, containing the remains of a child, near the mouth of Mitchell Creek on the Tallapoosa River. This location is adjacent to the historic site of Huith-le-walli, from which the archaeological site has been named.

The length of time during which most of the sites have been under cultivation, and the evidence of rather strong soil erosion during recent years at Pintlala, would indicate that the original surface of these cemeteries has been altered to a considerable degree since the burials were made. There seems to be no average depth at which the burials were placed. They generally occur between eight and forty inches below the present plow line. No instance of a burial urn found in a mound has ever occurred. At every site so far studied urn-burials are found associated with other forms of interment. A census, as of March 25, 1933, of the discoveries at Taskigi indicates that about 1500 burials are recorded in the notes of the members of the Alabama Anthropological Society who have worked at this site. Of these, about one-third were disposed in 204 burial urns. At Pintlala less than a hundred urns have been removed, and the ratio of urn-burials to all burials at this site is about the same as at Taskigi. A negro workman, who assisted Mr. Moore in 1899,

states that the latter's party took out 100 urns at Durant's Bend. Recently members of the Society removed four additional vessels from this last site.

Until 1933 it was believed that the custom of urn-burial was entirely a prehistoric trait. In that year, however, evidence of white contact was discovered in seven burial urns at Taskigi. Up to the present time this is the only site in which such European trade materials have been recovered in similar associations.

The most common type of urn is globular in shape and ranges from ten to twenty inches in diameter (Plate 7, Figure 2: c, d). The larger-sized vessels are most common, although occasionally small urns are found. Some very large vessels, twenty-six and twenty-eight inches in diameter, have been encountered. The great majority of these urns were covered with another earthenware vessel, which might be a similar inverted urn, a bowl of superior workmanship (Plate 7, Figure 2: a, b; Plate 8, Figures 2, 3), or the broken bottom of a bowl. Occasionally a skin seems to have been tied over the mouth of the urn, in which case it is usually inverted. Burial urns are found in pits which apparently had been dug for the express purpose of receiving them, and yet no uniform method of placing the urn within the pit is evident. These urns may occur singly or in groups. At Durant's Bend they are found placed in rows; at Pintlala they were apparently arranged in plots; at Taskigi they seem to be scattered about the cemetery among non-urn burials, although there is a suggestion of grouping in rows running east and west.

At Pintlala two unusual groups of urns were discovered. In 1915 nine urns were encountered in a group. Four, serving as containers for bones, were placed close together and each was covered with another urn. The ninth urn rested on the center of the pile formed by the eight others. A covering of burned clay protected the mass, and the entire structure was within a well made vault-like encasement of periwinkle and mussel shells, with which much ash had been mixed. In another part of the same site an orderly group of twelve urns was found in 1930. Eleven of the urns were arranged around a very large one in which there were parts of eight skeletons. Each of the eleven smaller urns contained the parts of one to three skeletons. All of the urns were covered with bowls, except the two smallest which had crudely shaped broken bowl bottoms fitted over them. Near at hand, and just to the north of the urns, was a square pit into which the remaining bones of the skeletons had been thrown in a jumbled mass.

At Taskigi there frequently occurred evidences of apparently older, non-urn burials in the form of partially decayed shell ear-plugs or beads in ashy soil with occasional bits of charcoal, near or below the urns. Sometimes they were as much as fifty inches below the plow line. This earlier culture possessed cruder pottery and pipes, but had shell objects of a superior quality. It was difficult to determine positive evidence of stratification, but it seemed clear that the urn-burials were placed into and on top of the remains of this earlier culture. Some indication of a time interval between burials was also found in the urn-burial complex itself. In 1931, at Taskigi, five urns, each with a cover, were found close together as if they had been placed in a single pit. On top of this group, and two feet nearer the surface, was a single urn-burial which had apparently been placed there at a later time than the five urn-burials.

Fully three-fourths of the urns found contain the remains of children and infants. This was evidently a form of primary burial; that is, the entire body was placed in the urn shortly after the death of the child. In these instances little trace of the skeletons remained in the vessels. It is probable that the empty urns which have been encountered once contained soft or immature bones which have since decayed completely. Most of the adult bones found in the urns are in perfect condition, when the surface drainage has been kept from them. This apparently was a secondary form of burial, for the jars are too small to contain an entire adult body. Such a conclusion is further borne out by the historic Choctaw burial custom which suggests that these bones may have been clean and hard when they were placed in the urn.

Frequently an urn-burial contains nothing but ashes, and sometimes charred human bones accompany these. Although this may indicate that the custom of cremation was practiced, the same condition could have been caused by the placing of hot or live ashes in the urns at the time of burial, rather than by an intentional burning of the bones.

In all cases, hardwood ashes were mixed with the earth which filled the pit in which the urn had been placed, and in those localities in which mussels, periwinkle shells, and kitchen refuse were available, these also were thrown into the pit. The author has found only four out of more than 500 instances in which the covering bowl was placed upon the urn sufficiently tightly to keep out the dirt and refuse which surrounded the burial. When the cover or urn itself are crushed, little more than parts of the skeletons remain. Seepage of water through the urns seems to have dissolved the bones, especially in those instances where they were not in contact with the lime and potash mixture. The chemicals in the

shell and kitchen refuse apparently preserve the human bones. In fact, the non-urn burials which are encased in ash and shell invariably contain hard, well-preserved bones, while those in sand are rarely indicated by more than a dark spot.

Most of the burial urns contained only the remains of human bones. In no instance have stone implements, such as celts, been found in them. Some of the urns containing burials of children and infants have objects associated with them (Plate 8, Figure 1). In one case a small human effigy bowl was in the urn; in another, an effigy was immediately beside the urn; and in still another case, seven small effigies (two ducks, a turtle, an unidentified animal, and three miniature bowls) accompanied a half dozen bones of a child. Quite often ear-plugs of shell, of both the dumbbell and bobbin type, are found in such burials.

At most of the sites which were occupied during the historic period the later non-urn burials, with which trade objects are associated, occur in areas which do not contain urn-burials. At Taskigi, however, these later burials are found scattered throughout the area occupied by the urn-burials. It is at this site that evidences of European influences are encountered in the urn-burials themselves.

The seven urns at Taskigi showing European influence contained very old glass beads in small quantities. In one of these were found several deformed skulls, aboriginal shell ear ornaments and gorgets, and blue glass trade beads. In another were eleven turquoise-colored beads of buckshot size and very old shell objects, associated with a small handful of human bone fragments. In all, less than a hundred glass beads have been found under these conditions, and these appear to be of the earliest Spanish introduction. There is a strong suggestion that they are attributable to the De Soto expedition.

It is not certain that the vessels used as burial urns were originally intended for this purpose. It is more probable that they were made for some utilitarian purpose, such as storage jars or pots for domestic use. The bowls of superior quality frequently used as covers for the jars may have at one time also served a utilitarian purpose, although the designs upon them suggest that they may have had a ritualistic significance associated with the burial ceremony.

The bowls used as covers along the lower Alabama River are usually plain and rarely ornamented. At Pintlala broken bottoms of bowls were frequently used as urn covers. However, the first vessel found at Pintlala carried a design which apparently represented a rising sun with rain and lightning. Similar designs are shown in Mr. Moore's illustrations

of materials found at Durant's Bend. The interlocking scroll pattern is common in Alabama (Plate 7, Figure 2: b; Plate 8, Figure 3). The hand-and-crossbones design occurs commonly both at Durant's Bend, where no evidence of European contact exists, and at the sites on the Tallapoosa River which were first visited by Europeans in 1540, and to which white traders came after 1619.

The burial urns are usually decorated only on the upper part and on the narrow, slightly constricted necks of the wide-mouthed vessels. The most common form of decoration consists of a series of palisades approximately parallel to one another, formed by strips of clay (Plate 7, Figure 2: d). These may be attached to the vessel throughout their entire length, or only at their ends. However, in no case are they strong enough to form utilitarian handles. When the urns occasionally do have stronger, utilitarian handles, they usually have only four.

Vertical parallel palisades are the most elaborate ornamentation found on the urns at Pintlala, where no historic town ever existed. The heavily shell-tempered, hard-burned urns at Durant's Bend and Taskigi possess triangularly joined, embossed palisades pointing obliquely in opposite directions and separated by prominent tits (Plate 7, Figure 2: c). Urns with upright parallel palisades pulled out to form multiple, non-utilitarian handles are also common at both sites. One urn from the Tallapoosa region had eighty-five such palisades. A design consisting of multiple dots between lines is much in evidence at Durant's Bend, but occurs only sporadically at Taskigi.

The occurrence of urn-burials at sites showing no evidence of having been occupied since European contact, their presence in sites which were known to have been occupied after the historic European period began, and the finding of European trade articles in a few burial urns at Taskigi, would indicate that this custom was practiced by the Indians, who once lived in what is now Alabama, for an indefinite period immediately preceding the coming of the white man, and that it was abandoned very shortly after the influence of these newcomers was felt.

Historical records furnish some clues to the possible identification of the Indian tribes which practiced urn-burial. The town of "Talise," visited by De Soto in September, 1540, was certainly less than ten miles away from, if not actually on, the site called Durant's Bend. "Talise" is a Creek word meaning "Old Town," implying that its inhabitants were Creeks. French records of 1714 show that "Bear Fort," a town of the Alibamos, was at the point of the bend less than three miles from the archaeological site. Muklassa, during historic times, was also an

Alibamo town. The French post Fort Toulouse, was established on the Coosa River in 1714, "adjacent to Taskigi, an Alibamo town." Later records refer to the inhabitants of Taskigi as Creeks. Although no historic Indian village existed on Pintlala Creek, the archaeological site was on the plantation owned by a direct descendant of the daughter of a chief of Taskigi, prior to the land cession by the Creeks in 1814.

Clearly, the sites at which urn-burials have been found were occupied by Alibamos during historic times, and were in some way claimed by the Creeks. Yet it is recorded that the customs of the Alibamos resembled those of the Choctaws more closely than they did those of the Creeks.

Numerous references to the customs of southern Indian groups occur in the writings of early European travellers and Indian agents. It is stated that the Creeks used the "flexed," the "anatomical," the "bunched," and the "basket" methods of burial, while the Choctaws exposed the bodies in arbors, picked the decayed flesh from the bones, and buried these bones in containers. Furthermore, it is said that the Choctaws flattened the heads of their children.

The southern part of the area in which urn-burials have been discovered was claimed, during historic times, by the Choctaws, but the northern part was apparently considered Creek territory.

The existence of non-urn interments at all sites containing urn-burials, the presence of non-urn burials with European trade objects at Taskigi, and the finding at this site of an urn-burial containing deformed skulls and European trade objects, would indicate that the prehistoric peoples practicing urn-burial were probably closely related culturally to the Alibamo, the Creek, and the Choctaw who occupied the area in which urn-burials occur, during historic times.

Although the custom of urn-burial resembles most closely the customs of the historic Choctaw, the records fail to show that this Indian group had any close association during historic times with the sites at which urn-burials have been found. On the contrary, historical records demonstrate that the Alibamo did occupy at least some of these sites after European contact. The Alibamo have been identified as members of the Creek confederacy. However, surveys of other areas of the state of Alabama which were known to have been occupied by Creeks have failed to reveal any evidence of urn-burials, which would indicate that it was not a universal Creek custom. The historical evidence leads, therefore, to the conclusion that the Alibamo were probably most

closely related culturally to the prehistoric peoples practicing urn-burial.

The association of this distinctive burial custom with characteristic ceramic materials and decorated shell objects should serve as an archaeological diagnostic complex of value in solving prehistoric cultural associations. Further work upon this problem may aid in clarifying some of the ethno-historical questions of the relationships of the Indian tribes of this area.

SOME ASPECTS OF THE LARGO CULTURAL PHASE, NORTHERN NEW MEXICO

H. P. MERA[198]

FOLLOWING a brief reference, in SCIENCE[199] to a paper presented by the writer at the Denver Meeting of the A. A. A. S., wherein the occurrence of Woodland-like vessel shapes in a Puebloan pottery complex was reported, a number of requests for further information have been received. In consequence of the apparent interest shown, the following preliminary report is offered.

During the progress of an archaeological survey of north central New Mexico in 1932, particularly in that section drained by the western tributaries of the upper Chama and southeasternmost affluents of the San Juan rivers, a large number of sites were recorded which, in architectural forms and pottery content, appeared to differ somewhat from more usual Pueblo patterns. The following year two structures in this region were excavated and more intensive surveys were made covering a larger area. Upon the totality of information thus obtained it has been possible to formulate the course and objectives for a program of investigation to be carried on over a period of several years. A condensed outline of this project, its scope, and a few of the problems involved are given below.

THE LARGO-NAVAJO PROJECT

A. It has now been demonstrated that Woodland-like pottery shapes in an otherwise predominantly Pueblo cultural complex were in use from at least the beginning of the 12th century up until about the first part of the 14th. This complex has been designated the Largo Phase.

Problems:

From where did these Woodland-like forms come and when were they introduced?

From which particular line of Pueblo culture was that part of the complex derived?

Did a Woodland people take over this Pueblo culture, or were they merged with one basically Puebloan?

B. In this same region, during the 17th century, an Athapascan people

[198] Laboratory of Anthropology, Santa Fe, New Mexico.

[199] August 13, 1937.

(Navajo) were first noted who used a pottery possessing striking similarities to the Woodland-like forms of the earlier Largo Phase.

Problems:

Were these styles obtained from the peoples of the Largo Phase?

Did the Athapascans introduce Woodland-like forms independently?

Was there involved a merging of the two stocks?

C. During the first half of the 18th century groups of Pueblo people representative of all the villages of that time are known to have left their homes to found others to the north in Navajo territory. Here, evidence shows they became so closely associated with the Navajos that, although the use of Pueblo styles in decorated pottery was continued, the indigenous Woodland-like type practically superseded their own utility wares. During this association a new and distinct type of polychrome pottery, decorated with Puebloan designs on an orange-colored ground, first appears.

Problems:

Did the Navajo, as the result of this contact, acquire certain cultural traits derived from Pueblo sources, and with these an infusion of alien blood?

What relationship, if any, exists between the orange-colored decorated pottery of the Navajo, sparingly produced during the 19th century, and that of the Pueblo-like type of the middle 18th?

WORK ON THE PROJECT ACCOMPLISHED TO DATE

1. An intensive surface survey covering and delimiting the territory occupied by the Largo Phase has been completed.
2. As a result of the survey it has been found possible to publish a tentative outline regarding a succession of architectural types together with some information on the ceramic situation.[200]
3. Two seasons of excavation have uncovered four distinct habitation types which corroborate, by some of the dates obtained, a previously postulated succession of architectural types. All notes on this work have been prepared for publication.
4. Another surface survey has covered a considerable portion of the area in which village sites demonstrate a cultural complex that in-

[200] Mera, H. P., Ceramic Clues to the Pre-history of North Central New Mexico, Laboratory of Anthropology, Technical series, Bulletin No. 8., pp. 8–11., Santa Fe, 1935.

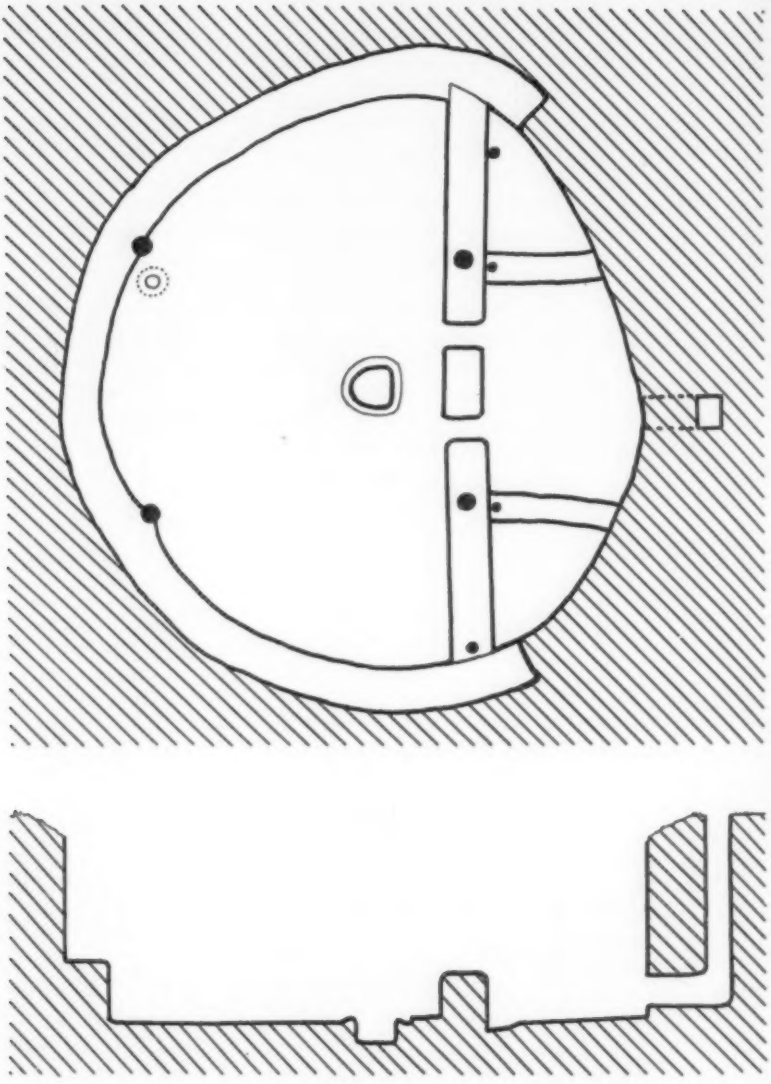


FIG. 14—Floor plan and north-south cross section through fire-pit.

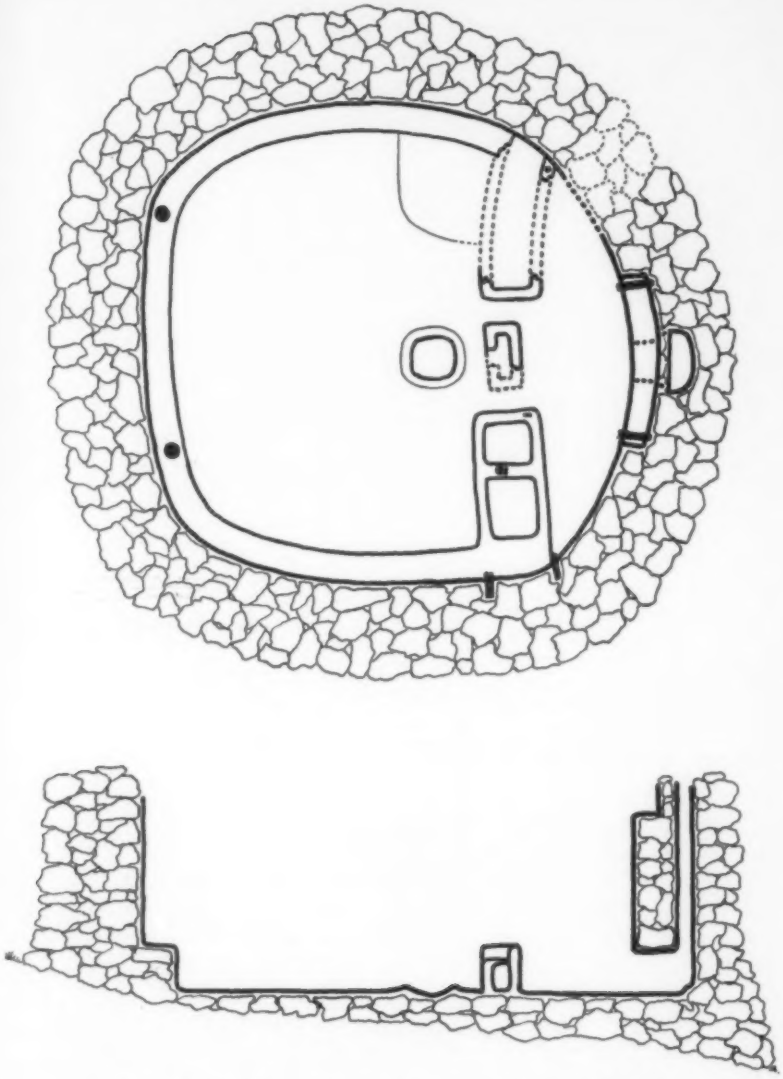


FIG. 15—Floor plan and north-south cross section through fire-pit.

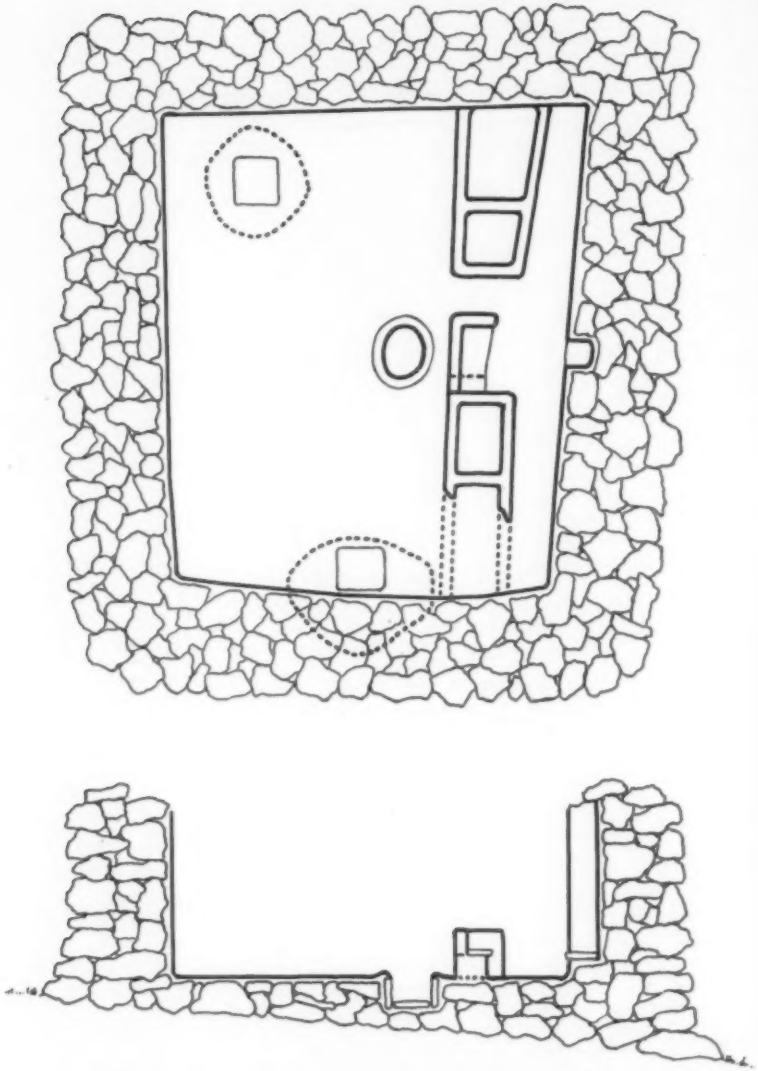


FIG. 16—Floor plan and north-south cross section through fire-pit.

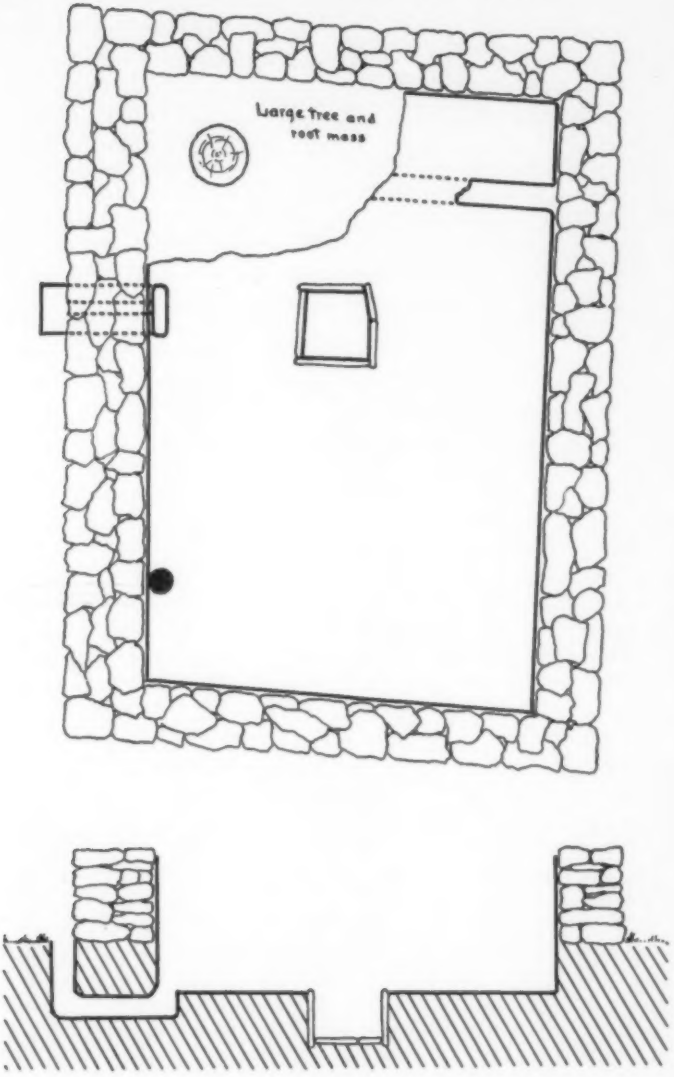


FIG. 17—Floor plan and east-west cross section through fire-pit.

cludes both Pueblo and Navajo pottery and domiciliary types. A number of building dates from these have been secured.

5. Nearing completion, is an illustrated paper on the several Pueblo ceramic types and their developments during the period from the 16th to the early part of the 19th centuries, one of the objectives of which is to better understand and identify the various kinds of Pueblo pottery found in abundance on these Pueblo-Navajo sites.

Of the four house types excavated, three were surface structures; the fourth, a pit dwelling. This latter (Figure 14) measures nearly twenty-five feet at its widest, with a floor level that lies seven and one-half feet below the present ground surface. Although no detailed descriptions can be made at this time, attention is particularly directed to a feature that seems to have been perpetuated in one form or another in all stages of architectural development so far investigated. This reference is to low-walled storage bins. Two of these may be seen in the floor plan flanking the broad central passageway that extends from the rear of the deflector toward the ventilating shaft at the southern extremity of the house. A construction date of A.D. 1106 has been obtained for this dwelling.

Figure 15 illustrates a surface habitation which, in addition to more highly specialized storage bins projecting inward from the periphery on a line with the deflector, possesses uncoursed, roughly piled stone walls averaging four feet in thickness. The inside dimensions are: north-south, twenty-one feet; east-west, twenty feet. In this example the ventilator is also oriented toward the south. Charred beam material yielded a building date of 1253–54.

Another structure (Figure 16) with the same type of massive wall construction differs in being rectangular in shape but has an analogous arrangement of storage bins, deflector, and ventilator which occupy positions along the south side of the room. An interesting occurrence is to be seen in two large sub-floor cists; one near the west wall, the other in the north-east corner. These have depths of six feet nine inches and five feet five inches, respectively. The average room width is seventeen feet; and the length, twenty feet. No dates were obtainable.

An apparent advance in building technique is shown by a rectangular house, ten feet three inches by fifteen feet six inches, having coursed masonry walls (Figure 17). These were laid directly on the surface of the ground, although the floor level had been sunk to a depth of eighteen inches below the base of the masonry. Remains of a storage bin were found at the southern end of the room. The ventilator, differing in one

1

3

2

4

5

FIG. 1—Pottery pipe; Fig. 2—arrow-shaft tool; Fig. 3—Woodland-like pottery vessel; Fig. 4.—decorated bowl; Fig. 5.—notched axe.

FIG. 1—Frontal region to show supraorbital ridges.

FIG. 2—Lateral view of skull to show the high position of the external occipital protuberance.

respect from the three previously noted, was situated on the east side and constructed so that no deflector was required. This was accomplished by sinking the outer section of the ventilating shaft to a depth well below the floor level, then transversely beneath the wall and again upward into the room, so that a current of air was not directed across the fire-pit. Though this house had been burned, no wood was recovered suitable for dating.

There remain other domiciliary types belonging to this phase yet to be investigated, among which are some that had even reached the small pueblo stage.

Notwithstanding a recognizable progression in architectural development, there did not seem to have been a corresponding advance in pottery styles. It is true that some of the painted pottery from sites, believed on architectural evidence to be among the latest, shows some elaboration of decorative detail, yet a great deal of the material from ruins of this class indicates the retention of older basic design formulas without alteration. Such a condition appears to be due to a lack of intercourse with peoples of surrounding areas, a view which seems to be borne out by the very evident scarcity of intrusive pottery. A typical decorated bowl is illustrated on Plate 9, Figure 4.

The presence of conical-bottomed, Woodland-like utility vessels as a normal constituent in the Largo ceramic complex, otherwise predominantly Puebloan in character, also presents a most unusual situation. Whole or partially restorable jars of this type have been found in every site excavated, and numerous sherds occur in surface collections, irrespective of the stage of architectural advancement. Fillets, plain or more rarely with simple decorative treatments, were universally applied at rim level or shortly below. Heights range from about eight inches to sixteen and one-half inches. An example having the latter measurement is shown on Plate 9, Figure 3.

Other objects of material culture identified with the Largo Phase are: a distinctive axe form, an unusual arrow-shaft tool, and a pottery pipe that approaches some of the elbow forms. This latter has two knobs affixed on either side at the base of the bowl to hold it upright when not in use. Typical examples of all three may be seen on Plate 9, Figures 1, 2, 5.

Although satisfactory progress is being maintained towards solving the several problems herein outlined, it is plainly evident that much more work remains to be done before even tentative conclusions may be drawn.

SOME SKELETAL REMAINS IN SASKATCHEWAN

F. H. EDMUNDS,[201] J. L. JACKSON,[202] J. W. T. SPINKS,[203] AND V. A. VIGFUSSON[204]

THE SKELETAL remains described in this report were found by Pius Fischer on November 14, 1936, as gravel was being dug from a pit[205] near the town of Bradwell, Saskatchewan, for highway purposes. The find was reported to the R. C. M. Police, and Detective Sergeant F. W. Davis kindly mentioned the matter to Dr. Vigfusson, who proceeded a week later to the site of the find with Professors Jackson, Edmunds and Spinks. Unfortunately, by that time the gravel had been excavated to a distance of about four feet beyond the original position of the bones, and thus all evidence of the condition of the burial had been obliterated. From Mr. Fischer's description, the skeleton was found in a flexed position with the face downwards.

The skeletal remains seem to have been found at a depth of four or five feet. The procedure used in the pit was to undercut the gravel and allow the material to fall. A considerable part of the skeleton was removed by the diggers before they discovered the skull and knew they were dealing with a human skeleton. Fortunately, some of the bones were recovered from gravel which had been taken to a road three miles north of the pit.

The bedded nature of the deposits is such that a casual glance at the gravel above the bones would have been sufficient to show whether any disturbance had taken place. The farmers who had been working in the pit did not notice any unusual features in the bedding, but without positive evidence it is necessary to consider the possibility of artificial burial.

The gravel pit is situated on the north slope of a tract of rolling country with "knob and kettle" topography, known as the Allan Hills. The highest part of these hills is seven miles south of the pit and has an elevation of about 2250 feet. The pit itself, at 1890 feet, is on the north side of a small hill which has no distinctive physiographic features to mark it from the other hills of the district. The surface deposits of the area are glacial in origin, mostly boulder clays. The sand and gravel in

---

[201] Professor of Geology, University of Saskatchewan, Saskatoon, Saskatchewan.
[202] Professor of Anatomy, University of Saskatchewan, Saskatoon, Saskatchewan.
[203] Professor of Chemistry, University of Saskatchewan, Saskatoon, Saskatchewan.
[204] Professor of Chemistry, University of Saskatchewan, Saskatoon, Saskatchewan.
[205] Sec. 36, Tp. 32, Rge. 2, West of the 3rd Meridian.

FIG. 1—Front view of right humerus showing the marked lateral bowing at the deltoid tubercle and the retroversion of the head.

FIG. 2—Front view of the left femur showing the platymeria present.

FIG. 3—Medial view of left tibia showing the retroversion of the upper end.

FIG. 4—Front view of the right tibia showing the squatting facet on the lower end.

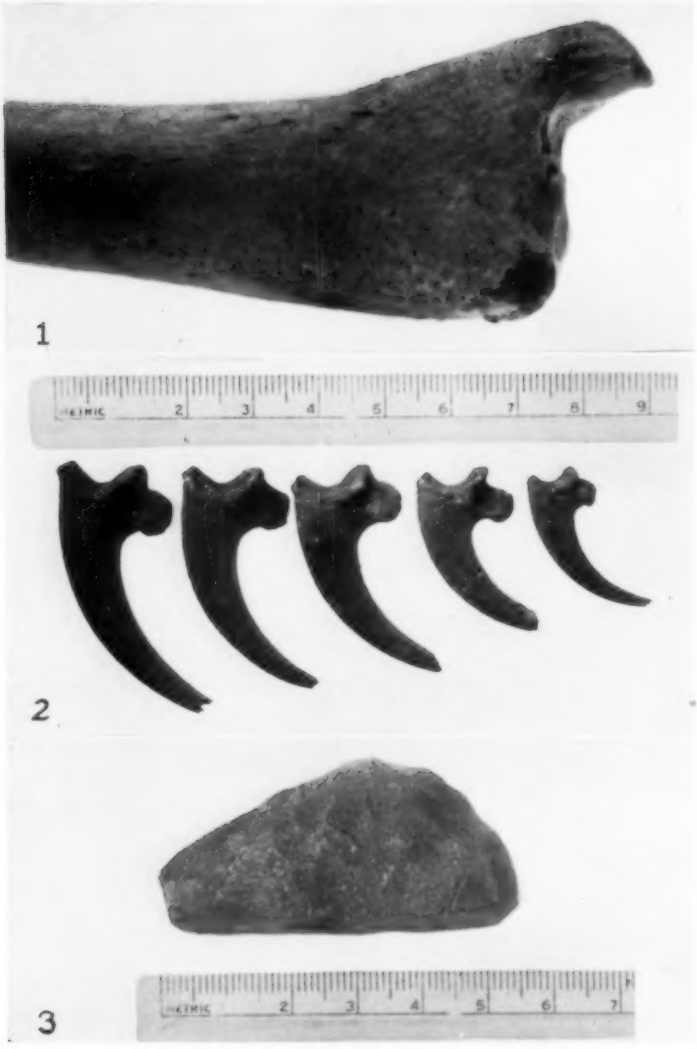


FIG. 1—Enlargement of Plate 11, Figure 4.
FIG. 2—Eagles' claws.
FIG. 3—Worked scraper or knife.

the pit is glacial outwash, of very local extent, formed during the final retreat of the Keewatin ice sheet; they are well bedded, four inches of surface loam overlying ten inches of medium coarse sand, which in turn overlies gravel. The gravel is comparatively fine, few pebbles being over three-fourths inch in diameter; it shows stratification in bands of slightly varying texture. Clay underlies the gravel at a depth of about five feet from the surface of the ground. No definite dating of the retreat of the ice from Saskatchewan has been made, but fifteen to twenty thousand years must have elapsed since the ice left the Bradwell area.

Some of the bones are absent, others are badly broken. However, from fragments found it has been possible to restore some of the broken parts. A list of the bones of the skeleton in our possession accompanies this communication. A few of the more marked features are noted here, and a more complete report will be made later.

The skull is very asymmetrical (Plate 10). It is long and narrow. The glabella-inion length is 197 mm.; the greatest breadth, 131 mm. The length-breadth index is 66.5 . . . which places the skull in the ultra-dolichocranial class.

The unusual features in the scapula are the slight retroversion of the glenoid fossa and the relative shallowness of the supraspinous fossa.

The humerus shows a marked convex bowing in the region of the deltoid tubercle, and what appears to be more than usual retroversion of the head (Plate 11, Figure 1).

The sacrum is fairly complete and resembles that of a female in shape and appearance. From a study of the pelvic bones it was concluded that the skeleton is that of a male.

The femur (Plate 11, Figure 2) shows rather pronounced antero-posterior flattening just below the lesser trochanter, more than usual torsion, and considerable forward bowing of the shaft. The femora show a marked difference in length and there is no evidence of fracture. The left bone is 472 mm. long; the right, 462 mm.

The shaft and upper end of the left tibia and the shaft and lower end of the right tibia are present. The upper end shows what may be more than usual retroversion. There is some side-to-side flattening of the upper end of the shaft (Plate 11, Figure 3). There is a well-formed concave squatting facet (Plate 11, Figure 4; Plate 12, Figure 1) on the anterior border of the lower end of the shaft, and a corresponding convex surface on the neck of the talus.

The bones are heavy. They are stained a reddish-brown with iron

oxide and the moist tongue noticeably adheres to the surface, which indicates a considerable degree of mineralization.

LIST OF THE PARTS OF THE BRADWELL SKELETON

Skull: Damaged, sphenoid, ethnoid, nasal bones absent. Mandible broken but restored. Second and third molars absent in maxillae and mandible. Two incisors present, one upper and one lower.

Vertebrae: First and second cervical present. One other cervical but damaged. Three thoracic and two lumbar in fair shape. Sacrum and pelvic bones slightly damaged.

Lower Limbs: Femora—both very little damaged. Tibia—right damaged in upper end; left damaged in lower end. Tarsal bones. Calcaneus—left present. Talus—right, damaged. Cuneiform—third, right and left. Navicular—right; portion of left. Metatarsals—complete, both sides. Phalanges—a few only. Patella.

Upper Limbs: Scapula—both damaged, left fairly complete. Clavicle—right, in good preservation. Humerus—right, upper end damaged. Radius—right and left; lower end of latter damaged. Carpal bones—right capitate, right lunate, right navicular. Metacarpals—All of the right, except the second. Ulna—left.

In addition to the above, there are a number of fragments which have not been identified.

Some search of the gravel pit failed to reveal any artifacts. However, a party carefully sifted the gravel deposited on the road, already mentioned, and found besides a number of bones, several claw-bones (Plate 12, Figure 2) and a worked scraper or knife (Plate 12, Figure 3). The claws were identified as eagle claws and may have been part of a necklace or other decoration associated with the skeleton. The chipped scraper is approximately 5.5 cm. long and 3 cm. at the broadest part. It is a piece of cream-colored quartzite and was partly coated with iron oxide and a small deposit of calcium carbonate near the smaller end. The flaking of this specimen does not appear to be distinctive.

All the above skeletal features are similar to those characteristic of primitive man (Neolithic man in Europe) as described by Cameron[206] We are thus led to suppose that the present find is of considerable antiquity. A more detailed examination of the bones and of the site is necessary before giving a definite opinion regarding the age of the skeleton. However, we consider that we have, in this specimen, an interesting example of early man in America.

---

[206] The Skeleton of British Neolithic Man.

THE FAMILY TREE OF CHACO CANYON MASONRY

FLORENCE HAWLEY[207]

SOUTHWESTERN Pueblo pottery of the prehistoric periods has been studied, named with dozens of geographic appellations, and traced back from period to period with genealogic thoroughness. "And La Plata Black-on-White begat Red Mesa Black-on-White, and Red Mesa Black-on-White begat Escavada Black-on-White, and Escavada Black-on-White begat Gallup Black-on-White." But the family tree of prehistoric Southwestern walls has not been cultivated with the ardor of the potsherd horticulturist; the relation of roots to branches has been largely conjectural.

In 1936, Roys[208] divided the walls of the ancient pueblos into two types, the Chaco-like and the non-Chaco. Surface finish was ignored; the classification was made on the basis of interior construction. The former was characterized by clay mortar which transmitted the stress from one stone to the other; the latter was characterized by the stones touching each other and hence transferring the stress directly from one to another. Mortar was present only as a filling for interstices. If we overlook the questionable practice of naming a widespread type by a negative term and pass on to the main point of the postulated different ancestry of these two large types, we find that the Chaco walls are supposed to have developed from the pithouse linings, where the slabs were laid onto clay, while the non-Chaco walls are believed to have come from dry stone masonry used, perhaps, in old windbreaks and watchtowers. This second historical hypothesis has, I believe, little data at present to substantiate it, but the hypothesis of the history of the Chaco walls was proved correct and the details of early development worked out in the 1936 Chaco excavations of the University of New Mexico. An account of the development of Chaco walls, however, necessitates a terminology of the local wall types as distinguished by structure and by surface finish, dated relatively by superposition, and absolutely by wood specimens incorporated into the masonry.

Perhaps nothing is more annoying to the archaeologist and to the reader of another's archaeology than series upon series of names of types, but if names are annoying, numbers are impossible. Jackson[209]

[207] Dept. Anthrop., Univ. of Chicago; and Univ. of New Mexico.

[208] Roys, L. (See Martin, P. S., Lowry Ruin in Southwestern Colorado), pp. 115–142.

[209] Jackson, W. H., Report on the Ancient Ruins Examined in 1875 and 1877, Plate LXII.

published numbered Chaco Canyon wall types in 1877; Judd[210] published a series of four numbered wall types for Pueblo Bonito in 1927; and I[211] set forth a series of six numbered wall types for Chetro Ketl, the neighboring pueblo, in 1934. Now, when someone else refers to Chaco Masonry III, whose type III is meant? The situation was further complicated when the University of New Mexico 1936 excavations uncovered a small house of Pueblo II, superimposed over ruins of Pueblo I, with wall types antedating those of both Bonito and Chetro Ketl. These could either be numbered Minus I and Minus II, and so add further confusion to the problem, or the whole group could be renamed. As the lesser of two evils, a system of descriptive names was chosen.

CHACO PUEBLO III WALLS

Crude Rubble Without Core (1116± A.D.)

The one wall type found in the Chaco different enough from the others to appear out of place there is that listed as type VI for Chetro Ketl.[212] It is apparently the latest to be used in the pueblo; only the uppermost facing on the great kiva and the walls of a few rooms built to adjoin older peripheral rooms in the plaza show this crude construction. The irregular stones are laid upon each other, hit or miss, with little mortar between. There is no surfacing. At present these walls are in a bad state of decomposition. They might be designated as *Crude Rubble Without Core*. Whether their builders were of the same group who built the other Chaco walls we cannot yet say. This type of wall was not found at Pueblo Bonito. The only method we have of dating these walls is by their abutment and superposition on earlier dated walls. As the latest date on the wall type which they cover is 1116 A.D., these cruder walls must postdate that year.

Fine Unbanded with Core, Spalled Blocks with Core, Inferior Wide Banded with Core (1100–1116 A.D.)

The latest of the dated Chetro Ketl walls brings to a close the main period of occupation of this pueblo. Between 1100 and 1116+ A.D., the masonry was varied into three types, which may be designated as *Inferior Wide Banded Masonry with Core, Spalled Blocks with Core*, and *Fine Unbanded with Core*. The former was retained from the preceding period of excellent workmanship; the latter two were new developments.

[210] Judd, N. M., Archaeological Investigations in Chaco Canyon, New Mexico.

[211] Hawley, F. M., The Significance of the Dated Prehistory of Chaco Canyon, New Mexico.

[212] Hawley, *op. cit.*, p. 15.

The masonry listed as *Fine Unbanded with Core*, Type V of Chetro Ketl[213] and described by Judd as Type IV for Pueblo Bonito,[214] consists of a rubble core, similar to that of the other types, faced with small slabs the size of the spalls used for the *Inferior Wide Banded* masonry. These slabs are set closely together. Characteristically it has no bands, although occasionally it lapses into a few feet of crude banding. It is about twenty inches thick. This type lacks the strength of the other walls of the period.

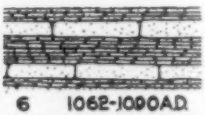
The Inferior Wide Banded with Core, previously described as Inferior Type III at Chetro Ketl,[215] and unknown at Bonito, has a rubble core of sandstone slabs laid in plentiful mud mortar and a surface of slabs with one face and the four adjoining edges finished. The large slabs are laid in uneven rows separated by bands of spalls averaging one and one-half feet in thickness. The spalls themselves are from one to one and one-half inches thick; the larger blocks are about four inches thick and from fifteen to twenty inches long. The wall averages some twenty inches in thickness. It was in a room of this masonry that the log dating 1116 A.D. made up a part of the ceiling.

The contemporaneity of the three types of this period is indicated by abutments, by one wall merging into another, and by contemporaneous dates obtained for all three by tree-ring studies of logs incorporated in the walls.

Fine Wide Banded with Core (1062–1090)

The second period of building in Chetro Ketl was the period of the finest masonry, that which may be designated as *Fine Wide Banded with Core*, formerly known as Fine Type III for Chetro Ketl[216] and as Type III for Pueblo Bonito.[217] Jackson lists it as Number II.[218] The core is of rubble in clay. The surface is of large well finished slabs of the same size as those used in masonry which is *Inferior Wide Banded with Core*, separated by rows of spalls of the same size and spacing as for the *Inferior Wide Banded*, but the rows are evenly spaced and the construction strong and beautiful. This period and this type of masonry marks the peak of Chaco architecture. Walls are of the same average thickness as in the later period.

[213] Hawley, F. M., *op. cit.*, p. 15.
[214] Judd, Neil, *op. cit.*
[215] Hawley, F. M., *op. cit.*, p. 14.
[216] Hawley, F. M., *op. cit.*, p. 14.
[217] Judd, *op. cit.*
[218] Jackson, Plate LXII.

	Period	Date	New Name
10 1116+A.D.	P III	1116 ± A.D.	Crude Rubble Without Core
9		1100–1116 A.D.	Fine Unbanded With Core
8			Spalled Blocks With Core
7 1100-1116 A.D.			Inferior Wide Banded with Core
 6 1062-1090AD.		1062–1090 A.D.	Fine Wide Banded with Core
5 1030-1070A.D.		1030–1070 A.D.	Narrow Banded With Core
4 945-1030A.D.		945–1030 A.D.	Unfaced Slab
3 ?-950A.D.	P II	900– 950 A.D.	Small Spalled Blocks without Core
2 850A.D.	P I	850– 900 A.D.	Slab Base Rubble
1 777±A.D.	B.M. III	777 ± A.D.	Slab Lined Pit House

Drawings by Robert Lister

CANYON MASONRY TYPES

Other Names			Description
Hawley, 1934	Judd	Jackson	
Chetro Ketl Type VI			Thick irregular slabs laid in abundant mortar
Chetro Ketl Type V	Pueblo Bonito Type IV		Rubble core faced with small slabs; unbanded
Chetro Ketl Type KV		Number III	Rubble core faced with blocks chinked with small spalls
Chetro Ketl Inferior Type III			Rubble core faced with uneven rows of slabs separated by wide bands of spalls
Chetro Ketl Fine Type III	Pueblo Bonito Type III	Number II	Rubble core faced with evenly spaced rows of slabs separated by wide bands of spalls
Chetro Ketl Type II	Pueblo Bonito Type II		Rubble core faced with slabs separated by narrow bands of spalls
Chetro Ketl Type I	Pueblo Bonito Type I	Number I	Thin irregular slabs laid in abundant mortar
			Small blocks surrounded with small spalls or potsherds in abundant mortar
			Slab base supporting rubble wall of small stones in abundant mortar
	Pit Houses		Slab-lined pits

Narrow Banded with Core (1030–1070)

The earliest period of considerable construction yet uncovered for Chetro Ketl shows walls of the *Narrow Banded with Core* masonry formerly listed as Type II for both Chetro Ketl[219] and Pueblo Bonito.[220] The core is of rubble in clay, the facing of slabs somewhat thinner than those of the *Fine Wide Banded with Core* and laid in rows separated by some three inches of spalls, averaging about one-half inch thick. This wall is neat and durable. It is of the same width as those succeeding it.

Unfaced Slab (945–1030)

The type of masonry described for Pueblo Bonito as Type I by Judd,[221] Jackson,[222] and myself,[223] is found at Chetro Ketl only in crude walls which run under the great kiva. This type, which might be known as *Unfaced Slab* masonry, consists of large but thin irregular slabs of sandstone laid in an abundance of mortar. The inner ends of the slabs, which project out to form the two sides, roughly interlock at the center. This type is found in other Chaco pueblos, especially at Una Vida, where it has been dated by beams imbedded in the walls. In this pueblo many of the lower walls are of this crude masonry, above which walls of the later types have been built as upper stories.

CHACO PUEBLO II WALLS

Small Spalled Blocks without Core (900–950 A.D.)

Below the *Unfaced Slab* masonry of Una Vida, excavation revealed another earlier type which was found to have been used for the Pueblo II construction of the small house listed as Mound 50 by the University of New Mexico during the 1936 excavation. This masonry is made up of small blocks of sandstone set upon each other with a clay cushion between. There is no core. The blocks are surrounded with small chinking stones averaging but a fraction of an inch in thickness, or with potsherds, characteristically the Escavada Black-on-White of that period. The wall is narrow, averaging about twelve inches across, and its instability frequently resulted in bulges and bends in its line. The small spalls are set in merely to prevent the clay mortar from squeezing out

[219] Hawley, *op. cit.*, p. 14.
[220] Judd, *op. cit.*
[221] *Ibid.*
[222] Jackson, *op. cit.*
[223] Hawley, *op. cit.*, p. 13.

between the blocks. This wall differs from the later *Spalled Blocks with Core* masonry in lacking the core. It might be designated as *Small Spalled Blocks without Core*. It is the masonry Roberts uncovered in his Arroyo House[224] of the same period, located nine miles up the canyon. In this small pueblo the potsherd spalls are likewise predominantly of the Escavada Black-on-White, accompanied by Exuberant Corrugated and by early Wingate Black-on-Red.[225]

The growth of the *Unfaced Slab* masonry from that of *Small Spalled Blocks with Core* consisted merely of substituting larger slabs for the blocks and of eliminating the spalls from the heavier wall.

CHACO PUEBLO I WALLS

Slab Base Rubble (850–900 A.D.)

Beneath the structure of Pueblo II at Mound 50, another structure was uncovered, a small village of contiguous, unevenly shaped, rectangular rooms with walls of a type not previously located in the Chaco. These were constructed by setting large sandstone slabs on edge in the ground, covering them over with a thick layer of clay, and using this foundation for an upper wall largely of clay but filled with small unshaped stones from four to six inches across. In the excessive clay of this wall we find the legitimate ancestor of the plentiful clay mortar of the succeeding walls, and we can hardly question the slab lining of a pithouse as the antecedent of the slab foundation of this wall, for the slabs are identical with those of a pithouse except that the former are placed above ground and encased in the clay covering. Burials associated with these rooms are accompanied by the Red Mesa Black-on-White of Pueblo I.

This structure was given an approximate date by placing it midway between the known dates of BM III and P II in the Chaco.

A somewhat similar type of wall was located by Kidder and Guernsey at Ruin 5, Fluteplayer House,[226] in the Kayenta district of northern Arizona, but in this structure the slabs were surmounted by adobe turtle-backs chinked with an occasional stone, and plastered over. No evidence of turtle-backs has been found in the Chaco structure, and small stones are plentiful throughout the clay.

---

[224] Report yet unpublished.

[225] Hawley, F. M., Field Manual of Prehistoric Southwestern Pottery.

[226] Kidder and Guernsey, Archaeological Explorations in Northeastern Ariz. p. 42.

BASKET MAKER III

Slab Lined Pit Houses (777 A.D.)

Slab-lined pithouses of BM III are found at scattered sites within a few hundred feet of Mound 50, and considerable rough La Plata Black-on-White pottery of that period is found in the dump of Mound 50. It is quite possible that further excavations will indicate pithouses beneath the P I structure of that mound. The date of the pithouses in this area may be gauged from Douglass' date on Judd's pithouse, 777 A.D.[227]

SUMMARY

Here the Chaco wall sequence is taken back by dated and superimposed walls to the pithouses which mark the beginning of Southwestern architecture as known at present. The succession has been charted, with new and old names indicated, to present the sequence for field use. Of the ten types, the first three after the pithouse and the last in the series are without core; the other five are built up of a core with facing. In all, the use of ample mud mortar was apparent, and all may be classified as "Chaco" under the Roys system. Superposition and tree ring dating, however, indicate a more exact period classification on the basis of cores and of surface type within the area.

REFERENCES CITED

DOUGLASS, A. E.
1935 Dating Pueblo Bonito and Other Ruins of the Southwest, National Geographic Society, Contributed Technical Papers, Pueblo Bonito Series, No. 1, 1935.

HAWLEY, FLORENCE M.
1934 The Significance of the Dated Prehistory of Chetro Ketl, Chaco Canyon, New Mexico, University of New Mexico Bull., Monograph Series, Vol. I, No. 1, 1934.
1936 Field Manual of Prehistoric Southwestern Pottery Types, University of New Mexico Bull., Anthropological Series, Vol. 1, No. 4, 1936.

JUDD, NEIL M.
1927 Archaeological Investigations in Chaco Canyon, New Mexico, Explorations and Field Work of the Smithsonian Institution in 1926, Smith. Misc. Coll., Vol. 78, No. 7, pp. 158–168, 1927.

JACKSON, W. H.
1878 Report on the Ancient Ruins Examined in 1875 and 1877, in Tenth Annual Report of the United States Geological and Geographical Survey of the Territories, by F. V. Hayden, pp. 409–450, 1878.

---

[227] Douglass, A. E., Dating Pueblo Bonito and Other Ruins of the Southwest, p. 51.

KIDDER, A. V. and GUERNSEY, S. J.
1919 Archaeological Explorations in Northeastern Arizona, Bulletin 65, Bureau of American Ethnology, 1919.

ROYS, L. R.
1936 Masonry of Lowry Ruin and of the Southwest, in Lowry Ruin in Southwestern Colorado, by Paul S. Martin, Field Museum Anth. Series, Vol. XXIII, No. 1, 1936.

REITER, PAUL,
1936 The Ancient Pueblo of Chetro Ketl, in The Chaco Canyon and its Monuments, by Edgar L. Hewett, Handbooks of Archaeological History, 1936.

SUPPLEMENT TO ARCHAEOLOGICAL WORK IN SOUTH AMERICA 1934–1936

WENDELL C. BENNETT[228]

SEVERAL articles have come to my attention which should have been included in the summary of recent archaeological work in South America.[229] A brief notation of these articles and a bibliography will remedy in part their omission from the original text.

Wassén (1936) has published a report of his excavations at the Hacienda of El Dorado between the villages of Yotoco and Restrepo in the Cauca Valley region of the western cordillera of Colombia. He describes the excavating of deep tombs, some from four to six meters in depth, and illustrates their contents. Although the collection is not a large one, it is important in representing excavated material from this section of Colombia. Dr. Hermann von Waldegg of Boston College excavated in Colombia in 1936 in the San Agustín region. Published accounts of his work have not yet appeared but he reports the discovery of 73 new statues and an extensive pottery series including some stratification. A note on Chiriqui and Quimbaya gold has been published by Marinus (1935), and Mason (1935) also comments on gold objects from Colombia and Ecuador.

In the Peruvian area Doering (1936) has published an article on portrait jars from the north coast region. The most recent report on the Cuzco excavations, with excellent line cuts, has been prepared by Llanos (1936). Franco Inojoso and Gonzalez (1936) have issued an account of an archaeological survey in the southern highlands of Peru in the Puno region. Specialized studies have been made on the occurrence of the guacharo (or oilbird) in Nazca design by Badaracco (1936), and on ethnobotany by Herrera (1936) and Vargas (1936). Mason (1935a) has a short article on the wooden keros of the Incas, and Antze (1936) discusses ancient Peruvian weapons. Two articles on textiles include one by Lavachery (1935) on a velvet-technique hat, and one by Funk (1936) on textiles in the highlands. Finally an article by Baudin (1935), and another by Minnaert (1935) treat of social themes in old Peru.

A number of papers by Aparicio deal with Argentine archaeology.

[228] Assistant Curator of Anthropology, American Museum of Natural History, New York City.

[229] This Series, Vol. 2, No. 4, pp. 248–259, 1937.

The first two (1935, 1935a) are accounts of archaeological exploration in the territory of Neuquén in the western central part of the Argentine. Another paper (1935b) describes exploration in the Santa Cruz region, particularly the petroglyphs seen. The final two papers (1936, 1936a) treat of the remains of the Comechingones in Cordoba and San Luis departments, and the ceramic remains and types along the Paraná. Rydén (1936) has published a long article, really a monograph, on his archaeological work in the department of La Candelaria. This is an excellent account, not only summing up the material excavated but also attempting to place it in relation to the confused northwest Argentine archaeological periods. As such it involves a re-evaluation of much of the northwest Argentine material. Two papers by Vignati discuss the use of the spear thrower in northwest Argentine (1936), and new investigations in San Luis section (1936a).

Latcham (1936) has an article on the Rio Loa ruins in northern Chile and another (1936a) on Atacameña metallurgy. Besides a good description of type metal artifacts of Atacameña and Diaguite periods, he presents an argument to show that copper comes into north Chile with the Tiahuanaco period, and that bronze is relatively late. Two articles by Cornely (1936, 1936a) describe Chilean-Diaguite cemeteries, the first at El Olivar, and the second at Bahía Salada. An article by Gigoux (1936) identifies shells found in Chilean archaeological sites.

Mason (1935b) has a short note on Santarem pottery from Brazil.

BIBLIOGRAPHY

APARICIO, FRANCISCO DE

1935 Grabados rupestres en el territorio del Neuquén. Publicaciones del Museo Antropológico y Etnográfico de la Facultad de Filosofía y Letras, serie A, Vol. III, pp. 99–107, Buenos Aires, 1935.

1935a Viaje preliminar de exploración en el territorio del Neuquén. Publicaciones del Museo Antropológico y Etnográfico de la Facultad de Filosofia y Letras, serie A, Vol. III, pp. 35–57, Buenos Aires, 1935.

1935b Viaje preliminar de exploración en el territorio de Santa Cruz. Publicaciones del Museo Antropológico y Etnográfico de la Facultad de Filosofia y Letras. serie A, Vol. III, pp. 71–92, Buenos Aires, 1935.

1936 La antigua provincia de los Comechingones. Historia de la Nación Argentina, Vol. I, Chap. V, pp. 389–428, Buenos Aires, 1936.

1936a El Paraná y sus tributarios. Historia de la Nación Argentina, Vol. I, Chap. VII, pp. 473–506, Buenos Aires, 1936.

ANTZE, GUSTAV

1936 Alte Waffen aus Peru. Baessler-Archiv, XIX, Heft 1–2, pp. 1–4, 1936.

BADARACCO, AUGUSTIN J.

1936 El Huácharo. Revista del Museo Nacional, Vol. V, No. 2, pp. 184–192. Lima, 1936.

BAUDIN, LOUIS
1935 Les interpretations du socialisme des Incas. Bulletin de la Société des Américanistes (Bruxelles), No. 17, pp. 51–56, Aout, 1935.

CORNELY, F. L.
1936 El cementerio indígena de "El Olivar" (La Serena). Boletín del Museo Nacional, Vol. XV, pp. 35–39, Santiago de Chile, 1936.
1936a Un cementerio indígena en Bahía Salada. Boletín del Museo Nacional, Vol. XV, pp. 41–46, Santiago de Chile, 1936.

DOERING, HEINRICH U.
1936 Porträts der Vorzeit. Atlantis, Heft 10, pp. 598–607, Oktober, 1936.

FRANCO INOJOSO, J. M., and GONZALEZ, ALEJANDRO
1936 Exploraciones arqueológicas en el Perú (Departamento de Puno). Revista del Museo Nacional, Vol. V, No. 2, pp. 157–183, Lima, 1936.

FUNK, ESTHER
1936 Textiles in the Peruvian Highlands. El Palacio, Vol. XL, Nos. 4–6, pp. 17–29, 1936.

GIGOUX, ENRIQUE ERNESTO
1936 Contribución a la conchiliología arqueológica. Boletín del Museo Nacional, Vol. XV, pp. 3–13, Santiago de Chile, 1936.

HERRERA, FORTUNATO L.
1936 El Perú: Botánica (Del itinerario de viajes de Raimondi, conclusión) Revista del Museo Nacional, Vol. V, No. 2, pp. 249–308, Lima, 1936.

LATCHAM, RICARDO E.
1936 Ruinas preincaicas en el norte de Chile. Boletín del Museo Nacional, Vol. XV, pp. 21–34, Santiago de Chile, 1936.
1936a Metalurgía atacameña. Boletín del Museo Nacional, Vol. XV, pp. 107–151, Santiago de Chile, 1936.

LAVACHERY, HENRY
1935 Un bonnet péruvien en simili-velours. Bulletin de la Société des Américanistes (Bruxelles), No. 18, pp. 131–5, Dec., 1935.

LLANOS, LUIS A.
1936 Trabajos arqueológicos en el departamento del Cuzco. Revista del Museo Nacional, Vol. V, No. 2, pp. 123–156, Lima, 1936.

MARINUS, ALBERT
1935 Bijoux Précolombiens. Bulletin de la Société des Américanistes (Bruxelles), No. 16, pp. 13–24, Mars, 1935.

MASON, J. ALDEN
1935 Gold in ancient America. Bulletin University Museum, pp. 22–25, Philadelphia, January, 1935.
1935a Three Inca Wooden Cups. Bulletin University Museum, pp. 53–55, Philadelphia, March, 1935.
1935b Collections from Santarem. Bulletin University Museum, pp. 46–50, Philadelphia. December, 1935.

MINNAERT, P.
1935 La Morale au Pérou. Bulletin de la Société des Américanistes (Bruxelles), No. 16, pp. 25–48, Mars, 1935.

RYDÉN, STIG
1936 Archaeological researches in the department of La Candelaria. Provincia Salta, Argentina. Etnologiska Studier, 3, pp. 5–329, Göteberg Museum, 1936.

VARGAS, C., CESAR
1936 El Solanum Tuberosum a través del desenvolvimiento de las actividades humanas. Revista del Museo Nacional, Vol. V, No. 2, pp. 193–248, Lima, 1936.
VIGNATI, MILCIADES ALEJO
1936 El uso del propulsor en el noroeste Argentina. Notas del Museo de la Plata, Vol. I, Antropología, No. 3, pp. 349–358, Buenos Aires, 1936.
1936a Nuevos investigaciones antropológicas en la provincia de San Luis. Notas del Museo de la Plata, Vol. I, Antropología, No. 4, pp. 359–379, Buenos Aires 1936.
WASSÉN, HENRY
1936 An archaeological study in the Western Colombian Cordillera. Etnologiska Studier, 2, pp. 30–67, Göteberg Museum, 1936.

CORRESPONDENCE

A Chronological Method Applicable to the Southeast

Any archaeologist who considers that his science is pledged to the task of rediscovering unrecorded and lost history, rather than to the collection of "curios," is hardly in a position to deny the paramount importance of chronology. Lacking a scale which demonstrates the relative ages of the various activities of an ancient people, we are at best merely the collectors of disconnected fragments of history, and can never hope to fit these fragments together to form a complete and logical story of the past.

Before the work of Nelson and Kidder in the Southwest, the archaeology of that area was in about the same condition as that which exists today in the Southeastern states. However, the work of these pioneer scientists and the well directed researches of those who have followed them have succeeded in giving a clear picture of the course of prehistoric Southwestern cultures that in some ways is better and more complete than would have been the story of the Indians themselves, had they left written records of their history.

Although the Southeastern states seem to be as wealthy in evidences of prehistoric occupation as the Southwest, unfortunately the same conditions of thick refuse deposits are not usually present, and the same reliable methods of vertical stratigraphy cannot be applied as frequently as in the Southwest. It seems that in this area archaeologists will have to adopt existing standard methods or develop new ones to determine relative age. The largely accidental discovery of superposition in occasional village sites, and similar evidence given by later intrusions into old burial mounds, provide valuable evidence, but such cases have so far been too infrequent to give anything like a complete chronology for even one small area. If we must trust to similar accidental discoveries to complete the entire picture, we must reconcile ourselves to a long wait.

However, there is the possibility that direct and constructive work may be done on southern chronology along lines that have been somewhat neglected. It is commonly accepted, apparently with good reason, that the pottery found so abundantly at the old sites must bear the main burden of comparative dating. Considerable attention has been given this cultural feature by a number of investigators working in this region, but the major part of their material has been burial furniture found accompanying the dead in mounds or cemeteries. Usually they seem to have overlooked the apparent fact that the potsherds found in the village refuse may be expected to give a better example of the full range of the people's ceramic styles than the pieces that were chosen to accompany the dead; moreover, the refuse material is usually much more abundant. Logically it appears that the approach to chronological problems lies in the study of the changes that have occurred with time in ceramic decorations as revealed by potsherds. This is not a new idea. Kidder's chronology at Pecos was based essentially upon the same thing.

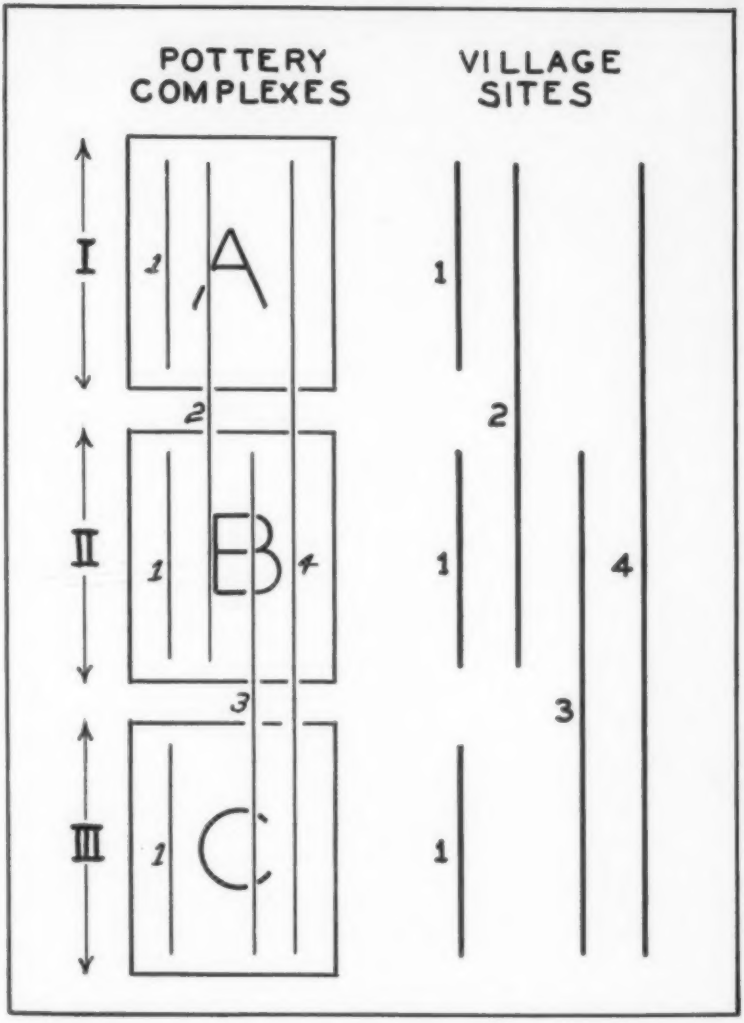


FIG. 18—Theoretical diagram of a chronological history illustrating possible actions of complexes (A, B, and C), pottery types (*1*, *2*, *3*, and *4*), and village sites (1, 2, 3, and 4).

In order to fully apply the methods of analysis outlined in the following pages, it is necessary that a collecting survey be made and representative samples of refuse material be secured from as many sites as possible in some area of comprehensive size—say one hundred miles square. The survey must be thorough enough for the investigator to be reasonably certain that he has secured at least a sample of every variety of material found in the area. The village sites of the Southeast are now very often cultivated fields, and the field-worker engaged in this type of survey will find little use for his spade.

The next step is that of classifying the material. The classification should be detailed. Repeated occurrence of a certain decoration at separate sites will determine for the investigator whether or not the decoration represents a real and significant type or is merely a local variation. It will probably develop that not only one but several distinct decorations will be found associated at a number of different sites. These associated decorations will be a group of styles that occur together, and form what has been termed a "decoration complex." A decoration complex covering a restricted area such as that under consideration probably represents a distinct time horizon. The stylistic time horizons that have existed in the area may now be logically separated.

However, there are numerous possibilities of becoming confused in this attempt. A review of conditions present in chronological histories that have been thoroughly developed will probably explain some of the peculiar conditions that are found. A generalized representation of a chronology is given in Figure 18. In this diagram the time periods I, II, and III are represented by the stylistic groups (or complexes) A, B, and C. These are shown by blocks placed one above another as they occurred in time. Within these blocks are lines representing the actions of definite style types. Such types as those marked *1* serve to differentiate the complexes. However, some types, such as those marked *2* and *3*, may have extended through two of the time periods but not the other. Others (*4*) may have extended through the entire time scale.

The length of tenure of a village site may act in a similar manner. This is indicated in the diagram by heavy black lines. Some sites, such as those marked 1, may have been inhabited only during the time when one complex of styles was in vogue. Others (2 and 3) may yield samples of two of the time periods but not of the third. Still others (4) may have existed all through the time scale.

Application of these phenomena of cultural chronology will not only serve to explain some of the conditions that are met with in attempting to determine complexes; they will also assist in arranging the complexes in their temporal relations. A linkage may be provided both by the overlapping of specific decoration types and varying lengths of tenure of village sites. Additional evidence may lie in the evolution of decoration types from one complex to another. This is not necessarily true. The area chosen for investigation may be distant from the region in which the actual evolution took place, and one complex may be replaced by another with no indication as to how the later types came into existence.

Another kind of overlapping may be present if, in the region adjoining that in which there were two subsequent complexes, an entirely different one existed through the time when one of the complexes was being replaced by the other. Trade material from this overlapping complex may then be expected on sites representing both of the subsequent complexes.

Of course the possibilities of readoption of abandoned decoration styles and reoccupation of old village sites would complicate this ideal scheme, but neither of these phenomena may be expected as a usual occurrence.

Preponderance of evidence must be accepted in determining types, in separating them into complexes, and in discovering relationships. Therefore, the reliability of these processes is in direct proportion to the size and number of site collections

Collections should be made from as many historic and protohistoric villages as can be located. The material from these sites will show which complex was the most recent and will determine which end of the chain of complexes constructed by overlapping is the latest. Without this tie-up it would be as logical for one end of the chronology to be recent as for the other. In some cases it may be more expedient to begin by determining the historic complex. Working back from this, the other complexes can be arranged in their true order.

A sequence of stylistic periods determined in this manner cannot be accepted as more than tentative. There are many possibilities of error in this method. Most of the work of classifying and comparing is highly subjective, and the worker is called upon to make many close decisions where he may be influenced by his preconceived ideas and desires. Then too there is the possibility that some unforeseen complication may be present to upset the apple cart.

However, such a tentative chronology is far better than no beginning at all. It is now possible deliberately to select sites at which superposition of materials may be expected. Stratigraphic study of these sites will provide a reliable check on the relative ages of the parts of the time scale that are involved.

After the chronology is established, the archaeologist will find himself in a position that, for the Southeast at least, will be novel. No longer must he excavate sites because they "look good." Instead, by paying attention to surface material, it will be possible to develop all the recoverable features of the various time levels in the area. New finds will appear in their true relation to one another instead of being a source of wonder and vague hypotheses.

However, it cannot be accepted that these ceramic complexes will represent different cultures or culture phases. It is entirely possible that two cultures may have used the same pottery, or at different times a culture may have changed its pottery types. What the method attempts to do is to use ceramic decoration, probably the most flexible of the remaining cultural features, as "type fossils" to distinguish the passage of time.

I do not insist that the foregoing is the only, or even the best method by which Southeastern chronology can be determined, but it is impossible to see,

without chronology, how we can ever hope to rediscover the cultural history of the Indians of the Southeast.

Bibliography

FORD, J. A. Analysis of Indian Village Site collections from Louisiana and Mississippi, Anthro. Study No. 2, La, Geol. Survey, Dept. Conservation, New Orleans, La.

KIDDER, M. A. and A. V., Notes on the Pottery of Pecos, Amer. Anthro., N. S., Vol. 19, No. 2, July–Sept., 1917, pp. 325–360.

KROEBER, A. L., On the Principle of Order in Civilization as Exemplified by Changes of Fashion, Amer. Anthro., N. S., Vol. 21, No. 3, July–Sept., 1919, pp. 235–263.

NELSON, N. C., Chronology of the Tano Ruins, New Mexico, Amer. Anthro., N. S., Vol. 18, pp. 159–180, 1916.

SPIER, LESLIE, Stratigraphic Technique in the Reconstruction of Prehistoric Sequences in Southwestern America, Methods in Social Science, Steward Rice, editor, University of Chicago Press, 1931.

J. A. FORD
School of Geology
Louisiana State University
Baton Rouge, Louisiana

LEGGED VESSELS FROM THE SOUTHWEST

In a recent issue of AMERICAN ANTIQUITY (April, 1937), Dr. Donald Brand has asked for information concerning legged vessels from the Southwest. These are best known from the Hohokam area where they occur with greater frequency than elsewhere. The recent excavations of Gila Pueblo at Snaketown on the Gila River yielded ten whole vessels of this type (eight tripod, two tetrapod) together with numerous fragments. All of these vessels were painted and in no sense endeavors to represent animals. Each vessel was assignable, on associated material, to the Sacaton Phase of the Sedentary Period, which has been correlated with the 10th and 11th centuries of the Christian calendar.

The Snaketown legged vessels constitute about three percent of all painted vessels dating from the Sacaton Phase in which fourteen other basic shape categories are represented. At least six standard shapes were less common than legged vessels. This bespeaks a relatively abundant use of the form, a fact further borne out by the presence of legged vessels in many private collections of Hohokam pottery.

Although the shape is known in unpainted pottery, notably Gila Red which can be assigned to the 13th and 14th centuries, it can be asserted that legged vessels were generally painted. The shape occurred prior to 900, as indicated by instances dating from the Colonial Period, but it did not become abundant until thereafter.

In most cases the legs are cylindrical rods of clay added to a shallow bowl or plate container. Hollow legs have not been reported. A hollow heavy-walled

vessel—sometimes called a censer—with rattle, is known. This is in the possession of Mr. F. G. Hawley of Inspiration, Arizona.

EMIL W. HAURY
University of Arizona
Tucson, Arizona

ANTIQUITIES OF THE NEW ENGLAND INDIANS

Induced by long interest in the cultural history of the tribes of New England, both past and present, and impressed by the extensive field of treatment and painstaking compilation of data on specimens and their interpretation by Mr. Willoughby in his recent monograph, *Antiquities of New England Indians with Notes on the Ancient Cultures of the Adjacent Territory* (Cambridge, Mass., 1935), I may be permitted to jot down a series of rambling thoughts evoked by again going through his chapters.

Some criticism will undoubtedly be laid at the door of the author for not having applied the new system of archaeological interpretation (McKern's concept) to the historical problems of the New England area. Much of the refinement in the latter has, however, been achieved since the material in the book went to press, in fact even since its appearance in 1935. At any period up until that time the author could not have been expected to utilize the more critically substantiated conclusions of which recent field workers in the Woodland area speak with considerable assurance—even while some of them may yet be changed. It should not be forgotten that Mr. Willoughby was practically the first of the mature students of museum material from the New England area to devote thought to questions of historical sequence in interpreting the meaning of the varied categories of industrial artifacts in his region. His papers on the stone ax, pottery types, wooden bowls, textile fabrics, and other traits evinced an early interest growing out of his careful thought along lines of explanation which has since been exploited. The results produced subsequently naturally diverge from the judgments that he was first minded to make.

Few, I think, would care to deny strenuously that Willoughby conceived over twenty years ago, before others had given the matter much attention, an idea that peoples of differing cultural degrees had occupied the southern portions of New England. This was upon archaeological evidence. Moorehead, trained in less careful disciplines of reasoning, had a similar contention for northern New England. The ethnological testimony was not far behind that of archaeology, and Dixon presented his views in a long-lived article on migrations of Algonkian peoples reaching the region and leaving sediments of graded woodland civilizations from the interior to the coast of Massachusetts and adjacent islands. Ethnologically I viewed matters myself in the same light, as long ago in fact as when I first became aware of even faint manifestations of stratification in the arts and institutions of tribes from Connecticut to the east-

ward. Conversation and discussion with Willoughby was then responsible for strengthening the impression, leading me to think in terms of Algonkian internal culture-sequence. The technonomy and the articles of agreement between the parties, archaeological and ethnological, may have changed and been improved by a better technique, but the forecast pictured by Willoughby remains integrally valid. While not qualified to venture proposals upon the outcome of future examination of archaeological sites now being investigated along the coast and islands of eastern Massachusetts, I shall, however, as an ethnologist concerned passingly with Algonkian history of the northeast, concur with the major premises of Willoughby. It may not even be out of order to mention again what I have hinted at in a short study concluded in 1928 (Indian Notes and Monographs, Museum of the American Indian, Heye Foundation, No. 44, 1928), namely, that the short steps of difference in passing eastward, characterizing the crafts, social institutions and legends of the various local groups of the mainland and the islands point, so far as extant data allow, toward differences in ecology and possibly in time of ethnic migration into the region. The coastal and insular groups betray closer affinities to conditions of the north Atlantic littoral; hence they may be judged marginal to the mainlanders both in location and in cultural typology—so possibly representing an earlier stratum.

Only recently, again resuming interest in the field of New England Algonkian cultural history during several trips to the Cape Cod Indian communities, Martha's Vineyard, and Nantucket, in company with Dr. V. J. Fewkes, I realized that certain new significant findings are to be reckoned with. In conformity with the previously formed idea in respect to a local coastal-hunting type of culture on Cape Cod and the off-shore islands, indications are being turned up by archaeological collectors in the territory which substantiate this premise. Sites are being explored by Mr. C. S. Crowell of East Harwich, which, amid refuse and shell-fish deposits, yield artifacts unquestionably associated with a dominant littoral culture based upon a marine fauna of a more northerly type. It would be premature to comment further upon the abundance of bone artifacts in these discoveries and the similarity of certain of them with hunting and hide preparing utensils (perforated toggle harpoons with partly open socket, and scrapers) in vogue among peoples of the cold reaches of coast to the northward. Bone remains of fauna from these deposits disclose testimony of an animal food supply suggesting a northern coastal economy—all, however, dependent upon and awaiting zoological identification at the hands of a specialist in local palaeontology. Should present anticipations of the idea of a former colder period prevailing along the Massachusetts coast develop into a reality, would it stand as evidence of an extra-habital locus of a coastal sub-Arctic population with its properly associated Canadian maritime fauna?[220] Then what should we name it?

[220] In this connection it may be worth noting casually that an Atlantic walrus appeared in the sea off Cape Ann—far south of its recorded occurrence in historic times at

Regardless of developments along these important lines, and regardless of what innovations of theory will have to be made to produce accord among the critics, Mr. Willoughby's early projected opinions on the marginal gradings of native culture in New England will be remembered by some of us with respect for his mature and conservative judgment, and prove adjustable to the admission that man lived in the Boston region during the warmer period following the retreat of the glaciers (estimate of Dr. H. W. Shimer; Willoughby, p. 9).

As a compilation, the book inevitably reflects the disadvantages as well as the profits of such an effort. We may well remind ourselves of the tantalizing vagueness of some of the earlier writers on the subject. Mr. Willoughby, trained in the museum and in the archaeological field rather than academically, has accumulated in the course of his active career vast experience and first-hand knowledge. His book embodies these qualifications. It will remain a noteworthy monument to his pioneering role in the initial stages of New England archaeology.

F. G. Speck
University of Pennsylvania
Philadelphia, Pennsylvania

Indians versus Pot-Hunters

The following resolution, which was presented by a group of Seneca chiefs on September 25, 1937, was occasioned by reports of inexpert excavations conducted by persons who devoted their time to finding relics which they are selling throughout this region. In a discussion before the Rochester Neighborhood Indian Society, there was also some feeling expressed that inexpert archaeological work conducted by untrained amateurs throughout the country was doing more to destroy the history of the red man than to reclaim it. Mr. Henry P. Sutton, President of the Society, is an intelligent Seneca and reads widely. His reactions resulted in the resolution, which was also read over the air on the occasion of American Indian Day. Station WHAM opened the wires on the air for the transmission of this resolution throughout the country.

Arthur C. Parker, *Director*
Rochester Museum of Arts and Sciences
Rochester, New York

Resolution

We, the members of the Indian Neighborhood Society of Rochester, together with our associated friends from the various Indian reservations of New

Sable Island—during the week of June 18, 1937, and was seen and photographed at Rockport, Massachusetts. The animal was seen by Artell Ceowley of the Straitsmouth Life Saving Station on the Sandy Bay breakwater, while on his watch. He observed it through his telescope and called Walter Church. They observed it for half an hour during which time they could note the tusks. An estimate of its weight made a minimum of 1000 pounds. It was also observed on the rocks at Thatchers Island and an attempt was made to shoot it (information reported by Reinhard S. Speck).

York and Ontario, look with disapproval upon the unskilled and unscientific excavations conducted by commercial relic hunters in the village sites and burial places of the ancient peoples of the first American race. Many of these excavations are on parity with grave robbing for the value of the trinkets recovered thereby. We protest that this work has no justification, that it is robbing America of the only remaining source of her pre-history and is an uncivilized affront to the memory of our forefathers.

We have no objection to the scientific examinations of qualified museums known to and approved by the National Research Council or of the Society for American Archaeology, or to individual scientists who keep careful records of a type having the approval of scientific bodies. Methodical and purposeful work adds to the sum of the world's knowledge, but the grave robbery of "pot-hunters" and relic diggers is repugnant to every person understanding the value of the material history that our ancestors wrote into the soil of Mother Earth.

Now, therefore, we, the Neighborhood Indian Society of Rochester, petition our State Legislature, the State Education Department and the moral and social agencies of our state, to enact suitable legislation forbidding excavations by untrained, unregistered and unlicensed persons, and further we petition that suitable penalties be recommended and adopted for infractions.

Unanimously adopted by the Neighborhood Indian Society of Rochester on American Indian Day, September 25, 1937.

Signed: HENRY SUTTON, *President*

TECHNICAL CONTRIBUTIONS TO THE STUDY OF ARCHAEOLOGICAL MATERIALS

Recently the writer has had occasion to apply modifications of several geological and biological techniques to archaeological materials. It is possible that some of these may be of interest to other workers, so a resumé is here presented.

Doctor Vladimir J. Fewkes has transmitted to me for study specimens of partially fired wattle from the celebrated Neolithic site at Homolka, Czechoslovakia,[231] in order to determine if grain or other plant materials were preserved in the matrix. Dr. G. W. Hendry[232] has been investigating adobe from the American Southwest with signal success in recovering specimens of economic plants. Adobe is sun-dried, consequently simple maceration with water will break down the matrix to its original divided form.

In the case of a partially fired or baked wattle (or brick), a mineral cement joins together the particles of clay, thereby rendering the product harder and more dense. A brick of this type can be macerated with a suitable dilute acid. For a brick cemented with calcite or iron carbonate a solution of two or three percent hydrochloric acid will disintegrate the specimen overnight without

[231] Proc. Amer. Phil. Soc., Vol. 71, pp. 357–392, 1932.

[232] Agric. Hist., Vol. 5, pp. 110–127, 1931.

violent or rapid reaction. If the cement is siliceous, a dilute solution of hydrofluoric acid of five percent strength will be satisfactory. This treatment will not damage any plant debris which may have been included in the fired sediment.

The plant fragments which are freed from the matrix by acid float out from the sludge upon slight agitation. These should be transferred to a solution prepared with equal parts of glycerin and ninety-five percent alcohol. This solution renders the plant structures more or less pliable as well as preserving them from decay. In many instances it is possible to recover such plant materials as small seeds, fruits, glumes of grasses, stems, and rootlets. Some of these can be identified by trained botanists.

The fundamental factor involved in the study of adobe, brick, and wattle is their common constitution—a natural sediment which has undergone very little alteration in the process of manufacture. There are many other kinds of altered sediments with which the archaeologist and anthropologist must contend.

During her recent visit to America, Miss D. A. E. Garrod came to this laboratory in order to ascertain whether a maceration technique was available which would decompose the dense breccia from the Mousterian caves in Palestine which she has made so famous. This coarse breccia is not only calcified, but also slightly silicified. It contains great numbers of flints, many bones, and some plant remains. An acid treatment might seriously damage any bone present, so that the method applied to wattle cannot be used. Through the generosity of Mr. H. L. Movius, Jr., and Miss Garrod, I have been able to obtain good samples for study. The method most suitable for freeing the ingredients from the breccia is one used by paleontologists. It is little known but is frequently used by a few investigators. I first became acquainted with it through Dr. I. P. Tolmachoff.

The specimen is placed in a hot saturated solution of ordinary sugar and allowed to remain in the solution for several hours, preferably overnight. The formation of crystals exerts sufficient pressure as the syrup evaporates and cools, to force apart the rock particles. The flint or bone can then be cleaned free of matrix very easily with a scalpel or scraper, and the plant debris can be recovered from the sludge. It may be necessary to repeat this sugar treatment more than once, because the extent of penetration by sugar is limited by the porosity of the matrix. Dr. E. C. Case uses potassium nitrate in place of sugar, but the procedure is otherwise the same. This is not a maceration technique but rather a mechanical process which can be applied to a variety of sediments.

Even the study of many types of ceramics may be approached from the point of view of their sediment-matrix which has been more or less altered in the process of manufacture.

It is probably true that much of the botanical information—excepting food plants—preserved in archaeological sites is either overlooked in the digging or thrown away as of little value. The Danish investigations into the Norse settle-

ments in Greenland are notable exceptions. Under ordinary circumstances it is possible to precisely identify the species of wood found in an object or in a habitation. If the site is now located in an arid region, such botanical evidence may be of great value. The centers of origin of most of our familiar economic plants are dubious or unknown, and it is only through archaeological exploration that they will become known.

I wish to express my appreciation to Dr. Fewkes for his invaluable suggestions given during the course of this investigation, and to Mr. Movius for the loan of fine specimens.

William Culp Darrah
Harvard University
Cambridge, Massachusetts

NOTES AND NEWS

Copenhagen, Denmark, and the International Congress of the Sciences of Anthropology and Ethnology

Not only every archaeologist, but every school child knows what the historical divisions: Stone Age, Bronze Age, and Iron Age, mean. They are used in all our school books to denote early stages of man's culture. Very few people know that these divisions originate with Christian J. Thomsen, the first Director of the National Museum of Copenhagen, Denmark. He first used these divisions in his works, thus laying the foundations for modern research, and they have since become part of our daily language.

Every archaeologist has, in one or another book, found the word: kökkenmödding, or in English: kitchen-midden. The study of kitchen-middens also originated with the staff of the National Museum in Copenhagen. The study of stratification and many other methods of archaeological investigation had their birthplace in Denmark, and we have enlarged and refined these early methods to suit specific situations. Likewise have they developed new methods at the Danish National Museum, methods which we are not as yet familiar with, as the reports in many cases have been published in Danish.

From the 1st to the 6th of August, 1938, the International Congress of Anthropology and Ethnology will hold its second session, in Copenhagen, and on this occasion H. M. King Christian X of Denmark and Iceland will open the new National Museum to the public. The famous stone, bronze, and iron age finds will be shown to the best of their advantage. In conjunction with the meetings of the Congress there will be made excursions to kitchen-middens, Viking graves, to a newly uncovered Viking ship, and to such historical spots as Kronberg Castle at Elsinor (of Hamlet fame), and those who wish can visit the grave of Bothwell, unfortunate husband of Mary Stuart.

Of even greater interest will be a special exhibit in the Royal Library where the original of the Flateyarbook, with the text relating to Leif Eriksen's discovery, will be placed before you, together with the original manuscripts of the Norse sagas. In this same exhibit will also be the famous Pomo de Ayala manuscript from Peru, probably one of the most important histories written shortly after the Conquest of Peru.

The meetings of the Congress are divided into the following sections:

A. *Physical Anthropology*

(a) Anatomical and biotypological anthropology. *Subject:* Mutual relations—Inter-relations and affinities of fossil man; Methodology; The conception of the "race" in anthropology.

(b) Physiological and hereditary anthropology. *Subject:* Geographical propagation of human blood types and their presence in the animal kingdom.

B. *Psychology*
Subject: Influence of civilization factors on character; general discussion with Sections B and F on the subject of cultural changes.

C. *Demographye*
Subject: Population movements seen especially from the view of birth and mortality.

D. *Ethnology*
Subject: Origin and development of agriculture and the raising of cattle. Origin of cultivated plants and domestic animals.

E. *Ethnography*
(a) Ethnography and folk-lore of Asia. *Subject:* The nomadic-pastoral peoples of Asia and Africa; together with sections E(a) and E(b).
(b) *African Ethnography. Subject:* See Section E(a).
(c) *American Ethnography. Subject:* The inter-relation between the Central American civilizations and those of North and South America.
(d) *Oceanic Ethnography. Subject:* The cultural relations between Oceania and Southeast Asia.
(e) *Arctic Ethnography. Subject:* Prehistoric and historic currents of civilization in the Circum-Polar regions.
(f) *European Ethnography and Folk-Lore. Subject:* Beliefs and customs concerning the agricultural year.

F. *Sociology and Religion*
Subject: In what measure can archaeology and prehistory serve as a basis for the study of intellectual culture? Joint discussions of Sections F and B on the subject of cultural changes.

G. *Linguistics and Writing*
Subject: Standardization of indigenous languages; formation of common languages—Creole languages and civilized languages spoken by indigenous peoples.

Those who should be interested in planning their summer vacation so that they can take advantage of this most important and interesting happening in the world of the sciences of anthropology and ethnography should communicate with their nearest travel agency or the Danish Tourist Bureau, 28 West 48th St., New York City, regarding transportation and cost. For further information regarding the congress, they can write either to Dr. Kaj Birket-Smith, Secretary of the Congress, National Museum, Copenhagen, Denmark, or to Frans Blom, in charge of the American Division of the Congress, Tulane University, New Orleans, Louisiana.

Pacific Coast Area

Cressman, of the University of Oregon, and a working party of ten have just spent six weeks excavating Catlow Cave. Part of the time they had Dr.

Smith of the Geology Department with them, and he and the Geology instructor spent more than a week on reconnaissance of the drainage problem of the Catlow Valley. This work showed there was no outlet, but that it was a typical basin lake bed which drew upon a vast area for its water. The further study by Antevs definitely established the lake as a contemporary of Lake Lahontan. Over two thousand specimens were collected, and these, added to those obtained in 1935, will bring the number of artifacts to well over three thousand.

In one section of the cave, where it was dry and relatively free from roof debris, the occupation sequence goes clear back to the water-smoothed rocks in the bottom of the cave. In the more exposed portion of the cave, where the greater amount of excavation was carried out, the occupation goes down to a stratum which is marked by many large roof boulders. This stratum, because of the moisture held by the rocks, is moist; very few artifacts are to be found in it, and these largely in the upper level. Probably the reason for the lack of artifacts even in the upper level is the moisture. A storage pit penetrating into the stratum from the drier level above indicated that the moisture was sufficient to destroy perishable material, for basketry in this pit was almost too rotten to be moved. Under this stratum of roof material one comes to beach gravel, and in this were found parts of a human skeleton.

The culture material consists of great numbers of pieces of basketry, many sandals, pieces of cane arrow shafts, arrow points, and perhaps some dart points, as well as a possible dart shaft. The basketry appears to be largely made out of tule, although some pieces, in which a twine and probably sagebrush bark is used, have an open-work pattern. This, except for the open-work pattern, suggests the soft bags of the plateau region around the Columbia. However, there is probably no connection.

The sandals show a change in style from those of the upper level toward the lower. They are for the most part made out of sagebrush bark. The style of basketry is the twined upon a two-ply twisted warp; the type has been found throughout the whole Basin region in southern Oregon and even on the northern stretches of some of the rivers draining into the Columbia.

An extremely old culture is indicated, one that can be defined as lacustrine, based upon the great lakes in the Northern Basin region. A cursory examination of the bird and mammal bones indicate a rather marked change in the faunal types of the region, at least in those whose remains were left in the cave.

Extended reconnaissance indicates other caves which give promise of even richer materials than that of Catlow. (*E.W.G.*)

Southwestern Area

An expedition under the joint sponsorship of the Peabody Museum of Harvard University and the University of Utah spent seven weeks during June and July excavating sites in the vicinities of Marysvale, Ephraim, and Tooele, Utah, under the direction of Dr. John Gillin. Thirty-five rooms or houses were

excavated at six sites, and a large collection of material culture was obtained, to be shared between the two institutions. The report is now in process of preparation. The field party included, in addition to Dr. Gillin, John M. Longyear, III, representing the Peabody Museum, who acted as surveyor and cartographer; Robert Lister, University of New Mexico; William Mulloy, University of Utah, crew foreman; Arden King, Carling Malouf, James Marshall, M. S. Winder, Jr., McKeen Brimhall, Lawrence Angleman, all of the University of Utah; and Raymond Proctor, Salt Lake City, cook. (*J. Gillin.*)

New Mexico Anthropologist

The students and faculty of the Department of Anthropology of the University of New Mexico wish to announce the new NEW MEXICO ANTHROPOLOGIST. They have long felt that there is a genuine need for a news sheet of anthropology in general and of the Southwest in particular, as well as for a publication devoted in large part to student work. In the last semester of the 1936–37 school year, therefore, they published a mimeographed sheet intended primarily for departmental consumption. This was received favorably enough so that it was decided to attempt the printing and wider distribution of a magazine of greater scope and more general anthropological interest.

This will be issued bi-monthly, and will retail for 35 cents a copy. Subscriptions will be $1.25 for one year of five issues. There will be no summer publication, that is, for the months of July-August.

Inasmuch as the publication must be self-supporting, if it is to continue to be printed, we ask that the anthropological world as a whole, and students in particular, give us the best of their support. Otherwise it may be necessary that we return to mimeographing. We earnestly solicit news of any anthropological nature from the various departments and research workers, as well as contributions from both students and professional workers. The first issue (September–October) contains a summary of the Departments of Anthropology to be found in the Western United States, a paper on Hopi Ethnology, a calendar of the Season's Pueblo festivals, a paper on Pueblo land grants, a directory of the students of the Department of the University of New Mexico, and a summary of work done at Giusewa and general anthropological news of the summer.

All subscriptions should be sent to James Spuhler, business manager of the NEW MEXICO ANTHROPOLOGIST, in care of the Department of Anthropology University of New Mexico, Albuquerque, New Mexico, and contributions to Douglas Osborne, managing editor, at the same address.

DOUGLAS OSBORNE
Managing Editor
NEW MEXICO ANTHROPOLOGIST

Great Plains Area

The Nebraska Historical Society's Archaeological Survey spent nearly six months in the field during the season just past. Excavation was made in eight village and five burial sites along the lower Platte River and the Nebraska side of the Missouri River from Omaha to the Kansas line. While the manifestations at most of the sites appear to represent foci of the Nebraska Aspect, other complexes were also encountered.

At the mouth of Salt Creek, in the vicinity indicated by Bourgmont in 1718 as being then occupied by the Otos, three different occupations were represented. The materials present in three lodge sites and several exterior cache pits belong to the Nebraska Aspect, while an Oneota affiliation is indicated by the pottery and other artifacts from one house and numerous cache pits. European-contact articles were present in pits with pottery having such traits as were characteristic of the Pawnee. In addition, a few sherds were found six feet beneath the surface in a cut bank, but the conditions of their deposition and their affiliation are not certain.

In Nemaha County on the Missouri River, several different manifestations were present, including a complex with shell-tempered, incised pottery. In the banks of a recently cut ravine, cultural material occurred at depths of as much as sixteen feet beneath the surface. Pottery recovered from a stratum in which a fireplace was observed, at a depth of about fourteen feet, has a Woodland-like appearance.

In addition to the excavations, a fairly intensive surface survey was made along the two waterways. As a result of the summer's work, additional progress has been made toward the clarification of the archaeological situation along the southeastern front of the state. Study of the materials collected during the season is already begun, and the results will be written up by Paul Cooper for publication in the NEBRASKA HISTORY MAGAZINE.

The Survey was privileged to have as visitors during the summer: Dr. J. B. Griffin, of the Ceramic Repository, Ann Arbor; Dr. Thorne Deuel, University of Chicago; Dr. Charles R. Keyes, Iowa State Archaeologist; Dr. Eric Douglas, of the Denver Art Museum; and Dr. Waldo R. Wedel, of the U. S. National Museum. (*A. T. Hill.*)

Dr. Waldo R. Wedel, leading a U. S. National Museum party, spent approximately five weeks on a small but prolific village site about four miles northwest of Kansas City. No trace of houses were found, but thirty-six cache pits were excavated and some three thousand square feet of detritus were examined to a depth of about two feet. The most abundant remains were sherds, of which two distinct types were recovered. One is the Woodland type, identical with the sherds from several deeply buried sites in eastern Nebraska —large conical-bottomed jars with cord-roughened exteriors and rims decorated

with embossed nodes punched out from the inside of the vessel. Directly associated and to all appearances contemporaneous with these were rim sherds bearing cross-hatched lines and punctate units, below which was a wide plain neck band. The characteristic body decoration of this second type seems to have consisted of non-dentate rocker impressions, occasional roulette imprints, and alternately smooth and roughened zones. There were several clear instances of four-lobed jars. Work in stone included large stemmed points, a rather varied chipped-stone industry, three-quarter grooved axes, and ground celts. Bone work included split metapodial beaming tools, antler projectile points of rather distinct type, perforated animal toe bones, imitation bear canines (perforated), antler cylinders, and long weaving needles. Worked copper was also found in the site as well as in a hilltop burial mound nearby; from the latter prior excavators had taken roulette-decorated pottery, a large fine chipped blade, and scraps of copper. The complex, certainly not characteristic Plains, seems to have a strong Woodland, and perhaps also Hopewellian, flavor. Similar incised and punctate Hopewellian-like rims and rocker-decorated sherds were found at two or three sites near Manhattan, 120 miles west of Kansas City; from a nearby mound earlier diggers had taken a biperforate bear or wolf canine. Still other recorded sites to the number of at least five or six were visited below Kansas City.

At Doniphan, where the Kansa village is supposed to have stood in 1724 sixteen protohistoric caches and a dozen burials were excavated. All of the work here was on the hills surrounding the present town; no protohistoric house sites were located. It was noted, however, that as the investigations were carried down hill toward Doniphan, the proportion of contact stuff and of shell-tempered Oneota pottery increased noticeably. It is possible that the main part of the Kansa village stood where Doniphan now is. Two circular earth lodges nearby were opened, evidently belonging to the Nebraska culture despite certain anomalies in form and content.

About thirty miles farther up the Missouri, forty-six cache pits and a circular earth lodge in an Oneota village were excavated. This is within twenty-five miles of the Leary Site but, unlike the latter, yielded quantities of copper, iron, and some glass beads. A half dozen rim sherds, all grit tempered and unquestionably assignable to the Lower Loup Focus, were secured. These pieces, while few in number, indicate that the Oneota on Wolf Creek were contemporaneous with the protohistoric Pawnee on the Loup River in Nebraska. (*W.R.W.*)

A University of Nebraska field party, under the personal direction of Dr. Earl H. Bell, and with WPA assistance, devoted the summer season to work at seven sites: (1) the Verdel Fort site, the remains of an old fortress attributed to the Ponca by G. Owen Dorsey, situated near Verdel, Nebraska; (2) the Ponca Fort Village site, near Site 1; (3) the Davis Mound Group, on bluffs one mile east of Site 1; the Larson site, near Niobrara; (5) the Pishelville site, on

the Niobrara River in Knox County; (6) the Redbird Village site, in Holt County; and (7) the Hogan site, an old Ponca burial ground at the juncture of the Niobrara and Missouri rivers.

The Ponca fortress at the Verdel site consists of a low wall enclosing an oval area 150×200 yards in dimensions. Excavations disclosed that there had been about the wall an outer trench about five feet deep and eight to ten feet wide. Post molds were found demonstrating the former presence of a stockade of large timbers surrounding the earthen wall. In addition to culture detritus representing the fort occupants, including historic trade materials, there was abundant evidence of an earlier occupation culturally related to the Upper Republican. A cemetery attributed to the later occupants produced the skeletal remains of people with brachycephalic skulls. Another cemetery produced, in addition to skeletal parts, associated trade goods: glass beads, copper, and lead; the bodies had been wrapped in bark and skins and placed in jug-shaped pits. Copper-preserved body tissues were obtained from these graves. Associated pottery was of the Upper Republican variety.

Circular house remains were encountered at the Ponca Fort Village site, with hearths situated centrally on house floors. Artifacts of stone, bone, and pottery were found in storage pits. A few historic trade articles were present. An Upper Mississippi-like culture is indicated by the materials. Burials contained crania of the brachycephalic type. It seemed evident that this village site was occupied by the fort builders well within the historic period, and the possibility of their being Ponca is of outstanding interest.

The mounds of the Davis group produced evidence of burials, and a few potsherds of Woodland-like variety. Although the skeletal material was in a very poor state of preservation, the crania were apparently dolichocephalic. Intrusive and therefore later burials in the mounds produced trade beads and the skeletal remains of people with brachycephalic skulls.

A Woodland-like culture was represented by materials obtained at the Larson site. Adjacent mounds were found to contain secondary burials, with dolichocephalic crania, and Woodland-like pottery.

At the Pishelville site a circular earth lodge, forty feet in diameter, was excavated. The culture detritus present resembled that found at the Ponca Fort Village site.

Similar house remains were encountered at the Redbird site. Moreover, excavation uncovered what is believed to have been a sweat-bath house. The culture represented is similar to that apparent at the Ponca Fort Village and Pishelville sites.

Skeletal materials in an excellent state of preservation were taken from graves at the Hogan site. There is no doubt that these are historic Ponca remains.

The indications are that this region in Nebraska was occupied at an early period by mound builders possessing a Woodland type of culture, followed by people with an Upper Republican type who, to some extent, remained to be

contemporaneous with the last occupants, the Ponca, into the historic period. (*E. H. Bell.*)

Mr. H. M. Sayre reports interesting results from the excavations conducted during the past summer in Inscription Cave, Montana. Thirteen and one-half feet of stratified deposits, partly wind- and partly water-laid, were found on the floor of the cave. From six to ten feet of slab rock, fallen from the cave roof, rested upon this deposit. This part of the cave appears to have always been dry, and a quantity of perishable material was found below the slab rock.

Evidence of human occupation was plentiful and, since trade materials of European cultural origin and any evidence of the horse were lacking, a pre-contact era would seem to be exclusively represented. Materials found include: polished bone implements, together with stone knives and saws employed for cutting the bone; arrow shafts with the rawhide wrapping and bits of feathers intact; pieces of buckskin showing the sinew sewing; sinew thread; peelings and fragments of cooked Indian turnip; kitchen refuse including the bones of many large and small animals. No pottery was found at the cave.

The site was cross sectioned and mapped in great detail, and the material carefully documented and removed to the Montana School of Mines, University of Montana. (*H. W. Sayre.*)

Northern Mississippi Area

Under the Minnesota Division of State Parks and the National Park Service, exploration of the archaeological resources of the site of Fort Ridgely, Minnesota, was begun in November, 1936. Work on this site, which was of importance during the Sioux Outbreak of 1862, is concerned chiefly with the remains of the historic period of the military occupation, but one portion of the site has furnished evidence of previous aboriginal occupation, one of the later buildings having been constructed upon a small habitation site. Remains of buildings comprising the post, where possible, are being stabilized as ruins, old lime mortar of the foundations being replaced with concrete. Only one building, the commissary, of native stone, is to be restored; a portion of the original is still standing, which furnishes a working model, and many historical documents have been consulted in the preparation of plans for the restoration. This rebuilt structure is to be used as a museum and meeting place, where displays illustrative of the prehistory and the history of the area may be placed. Many objects useful for this purpose have been obtained in the course of excavations thus far.

Dr. John P. Gillin has joined the faculty of the Ohio State University as Assistant Professor in the Department of Sociology, charged with the development of the courses in anthropology. Courses to be offered next year include Introduction to Anthropology and Archaeology, General Ethnography, Primitive Society and Primitive Religion, open to undergraduates, and a seminar on

Cultural Theory for graduate students. It is hoped before long to expand the study of archaeology with the coöperation of the Ohio State Museum.

Northeastern Area

This season Messrs. Douglas S. Byers and Frederick Johnson of Phillips Academy completed their excavation, begun the previous season, of the Nevin shell heap at Blue Hill, Maine. Ground slate and barbed flint points, gouges, plummets, and burials containing hematite are among the additional finds which appear to link this coastal component with the "Red Paint" graves of Maine described by Willoughby and Moorehead.

The following comment on his activities is from Dr. Warren K. Moorehead, Director of the Department of American Archaeology of Phillips Academy:

"Perhaps the readers of American Antiquity, and particularly my many friends, might be interested in a personal statement. I am gradually retiring from active work in American archaeology. As I am no longer young, I believe that past expeditions and studies should be put in shape for publication. With this in mind, and with the assistance of several persons familiar with archaeology and Indians of the Susquehanna Valley, we have virtually completed our study entitled: *The Susquehanna Expedition of 1916*. We are at work upon the surveys and manuscripts of Illinois archaeology. When Engineer Taylor, others, and myself ended our labors, Dr. A. R. Kelly took over the Illinois work. The University of Illinois has made a modest grant for the preparation of manuscripts and conclusions. We hope to issue the report sometime this winter.

"Beginning in early youth, I set down, in diary form, a lengthy record of personal experiences and observations. Much of this, being a narrative rather than a technical report, would not interest professional archaeologists. Yet, as I knew personally many of the men who later became famous in American archaeology, it seems proper to prepare and publish the personal record. This would also cover many years in the Indian Service, Department of the Interior.

"Several scientists, whom I knew for many years, left us complete, learned, technical reports of their life's work. None of them, however, saw fit to present an interested public with a personal narrative." (*W.A.R.*)

The newly organized Champlain Valley Archaeological Society, at Fort Ticonderoga, New York, headed by Messrs. H. Jermain Slocum and S. H. P. Pell, is conducting its initial field work in northeastern New York and western Vermont. John H. Bailey, in charge of the field parties, reports the discovery of about a dozen graves and pits containing punctate-marked pottery, and refuse deposits yielding sinew stones, projectile points, drills, pendants, gorgets, and potsherds, in the sand layer capping the clay deposit in which Olsen of the Museum of the American Indian, Heye Foundation, recently found tube-bearing burials near Orwell, Vermont. This is one of the best examples of culture superposition in New York State. Other sites in the region will be explored during the late summer and fall. (*W.A.R.*)

On Oneida Lake, central New York, the Rochester Museum of Arts and Sciences, under the directorship of Arthur C. Parker, is making one of its most important contributions to the archaeology of the New York area. William A. Ritchie, in active charge of the work, and four assistants, during the months of July and August, excavated two large village sites which for the first time established the association of a number of artifact types previously known only as surface strays over a large portion of the state. From deep refuse deposits a wide variety of distinctive notched, barbed, and triangular projectile points, the gouge, plummet, several forms of the bannerstone, native copper implements, choppers, and other traits were recovered. A number of burials also came to light. One of the most perplexing problems of New York archaeology is thus approaching a solution. (*W.A.R.*)

Since March, 1936, the New Jersey State Museum has sponsored a WPA project called "The Indian Site Survey," which has employed an average of sixty persons. The work is being supervised by Dr. Dorothy Cross under the direction of Mrs. Kathryn A. Greywacz, Curator of the Museum. The work is divided into four main departments: Excavation, Research, Site Survey, and Inventory of Collections; with the greatest emphasis, of course, being placed on the excavations.

Throughout the past year and one-half, seven main and eleven minor sites in Burlington, Gloucester, Mercer, Middlesex, Monmouth, and Warren Counties have been excavated. During the coming year it is planned to continue operation on some of the sites now under excavation, and to open new "digs" in other parts of the state. Work will continue on the famous Abbott Farm which is situated on the Delaware River bluff one mile south of Trenton, Mercer County.

This work will be supplemented by trial "digs" along the bluff above and below the Abbott site, to secure material with which to compare that from the present excavation. In conjunction with the main excavations it is planned to make a series of deep cuts into the bluff in an attempt to settle, if possible, the geological as well as the archaeological possibility of the occurrence of a glacial man.

It is planned to continue also the excavations at Red Valley at the base of Sugar Loaf Hill, near Holmeson, Monmouth County, the site where eight perfect bannerstones have been found recently.

In addition, work will be started in the spring in the rock shelter region of Sussex County and in the southern part of the state, near Bridgeton, Cumberland County.

The work of the other departments will continue. The located Indian sites are to be plotted on a master map. A companion map will be compiled containing Indian trails and historical places, such as battle grounds, treaty places, and the like. This will be pictorial.

The information collected by the Research Department has been arranged

in a master file at the State Museum. This information will be arranged into small pamphlets on various topics: Food, Shelter, Dress, and so on, which will be illustrated and adapted to school use. (*W.A.R.*)

The annual dinner address of the National Academy of Sciences, held at Rochester, New York, October 26, 1937, was delivered by Dr. Arthur C. Parker, Director of the Rochester Museum, who took as his subject, *An Anthropologist Looks Ahead*. A survey of the objectives of archaeology was included. (*W.A.R.*)

Middle America

The University Museum, Philadelphia, prosecuted its seventh season at Piedras Negras, Guatemala (Maya "Old Empire"), with Dr. and Mrs. Linton J. Satterthwaite, Jr., Francis M. Cresson, Jr., and Miss Tatiana A. Proskouriakoff as staff, and Don Victor M. Pinelo as Guatemalan government Inspector.

Six "palaces" were worked for information on the function of these long buildings. Six new thrones were encountered, each with the ornamental back-screen which is considered a safe throne diagnostic, together with two benches similar to many throne seats, one without the screen, the other possibly without it. A throne is a stone or masonry table or bench on which a Maya notable sat in state. This is deduced from relief representations in the Usumacinta, Puuc and central Peten regions. To date, out of seventeen known palaces, eight contained eleven thrones and two benches which may have been such. This number may increase with more complete excavation of four of these eight. Four palaces did not contain furnishings of imperishable material; five others have not been investigated for them. Among the palaces there is still no sign of the burned stone "column altar" which occurred, or probably occurred, in fourteen of the sixteen supposed temples. In only one temple is there a bench of the throne type, and that temple plan is atypical.

It seems clear that in the temples the priest usually functioned as the servant of the gods, burning incense around the altar, the center of interest. In some of the rooms of many of the palaces the thrones made the priest himself the center of interest, perhaps as civil or religious administrator. This is true also of the outer rooms of one, probably two, and possibly more of the eight known sweat-houses.

Only two of the thrones are so placed that more than a few persons could gather in a court or plaza in front of the rooms containing them, as is the case with the temple altars; nor are thrones usually centered behind a doorway. Many of them could have functioned in no larger a gathering than that depicted on Lintel 3, now in the University Museum. Since many of these thrones are secondary constructions, and thrones are absent in at least one-quarter of known palaces, additional uses for these buildings seem assured. There is no sign that this was ordinary habitation.

A minor problem in palace design was attacked and perhaps solved. The

transversely placed end-rooms, so common in double or multiple-range palaces in Peten and Yucatan, are typical at Piedras Negras but rare or absent at Yaxchilan and Palenque, the two other important Usumacinta district sites. Three bits of evidence point to their introduction here under Peten influence in a middle period. These are the discovery of a double-range palace without the end-rooms, the late addition of the end-room to the predecessor of another, and the remodeling of a third to supply them where originally absent. Apparently this was an innovation rejected at the other sites.

Excavations on nine temple substructures showed marked correspondences with central Peten design; this influence, established a year ago, was evidently strong for a considerable time. A stratification of inset rectangular over inset round corners was found. Two pyramids had a type of relief decoration new to the site and possibly to Maya architecture generally. The elaborate deity masks of Pyramid K-5 were shown to belong to the latest of three superimposed pyramids. A seemingly new type of geometric relief terrace decoration was found on the Acropolis. Apparently fairly early, this was incorporated in the base of a later pyramid showing Peten characteristics.

Work in the group containing all the earliest dated stelae confirms the belief that this group originally consisted of buildings on low substructures, preceding the later pyramids and probably preceding the carved and the few well-made plain stelae on the surface. Finding an extremely small, crudely formed plain stela, broken and used in early masonry, suggests that the stela idea reached the site before it was ready for stone carving or the erection of moderately heavy monuments.

An important series of late pottery shapes comes from one palace, where pots were left in profusion on floors and thrones. This collection was begun a year ago, but is now greatly augmented. Most were undoubtedly polychrome painted, but being in a non-vaulted palace with little protecting debris, humic acid has destroyed most of the decoration. Sherds in moderate numbers were collected from various superimposed building levels. Anticipating a proper study of sherds now available, it seems safe to say that two pottery periods will be distinguishable on the basis of bowl shapes and decorations. The moderate-sized, rounded-bottom, flanged tripod occurs in the earliest known deposits. Since similar flanged forms are typical of the third of four main ceramic periods at Uaxactun, in the Peten, a later beginning of occupation at Piedras Negras is implied. This does not impeach the architectural evidence that this was before the earliest carved Piedras Negras dates. For the first time figure carving is represented by satisfactory portions of several bowls, all surface specimens of flattened hemispherical form. Plumbate ware continues to be absent from the collections. In view, however, of the extreme rarity of carved ware—a dozen or so of finds in seven seasons—it may have been missed. (Report supplied by Linton Satterthwaite, Jr., Director of the Expedition; *J.A.M.*)

Dr. A. V. Kidder has kindly prepared the following notes regarding the

archaeological researches of the Carnegie Institution of Washington during the past season in Middle America.

Copan: Gustav Stromsvik in charge, Aubrey S. Trik, Assistant. Mr. Stromsvik devoted the major part of the season to the assembling and studying, with the help of Dr. Morley who spent some six weeks at Copan, of the scattered stones of the great Hieroglyphic Stairway. The section of the Stairway still in place was consolidated and such higher steps as could confidently be re-assembled either on the basis of the old Peabody Museum photographs or on internal evidence, were replaced. Mr. Stromsvik also conducted excavations in a Ball Court adjoining the Hieroglyphic Stairway, finding three levels of reconstruction and recovering some beautifully sculptured markers.

Mr. Trik continued study and repair of Temple XXII, the elaborately sculptured edifice which was originally excavated by Maudslay, but which was badly damaged by the earthquake of 1934. In the course of this work, Mr. Trik recovered from the fallen material below Temple XXII a number of very fine stone heads which originally formed part of the decoration of the facade.

Mr. Stromsvik completed the diversion canal and constructed a dam which it is hoped will prevent the Copan River from further encroaching on the ruins.

Uaxactun: A. Ledyard Smith in charge, E. M. Shook, Assistant. In this the, for the time at least, final season of excavation at Uaxactun, Mr. Smith completed excavation of the great multi-chambered structure known as the Palace, recovering further data on the stratigraphy both of pottery types and architectural practices. He also conducted minor excavations in a number of other buildings, the most interesting finds having been made in Temple A-XVIII, where there was unearthed a tripod vase containing an anthropomorphic jade figure some eleven inches high; and in Temple B-XIII, one of whose rooms contained a beautifully preserved fresco ten feet long depicting a ceremonial procession.

Guatemala: A. V. Kidder in charge; Jesse D. Jennings, Assistant. Excavations were continued at the Mound at Kaminal-juyu, on the outskirts of Guatemala City, which was partly cleared in 1936. The tumulus was found to consist of eight superimposed structures, the five outermost of pyramidal form. In a line running from below the center of the earliest structure eastward to beyond the limits of the mound were six tombs, each of which contained a principal skeleton and the remains of several apparently sacrificed victims. Large amounts of mortuary offerings were recovered. Two similar tombs lying to the west of a nearby mound were also cleared.

During the winter, Dr. H. E. D. Pollock conducted a reconnaissance in the Guatemalan Highlands and on the Pacific Coast, later in the season joining Messrs. A. L. Smith and Shook for a canoe journey down the Usumacinta, visiting Altar de Sacrificios, Yaxchilan, and Piedras Negras, where the party visited the University of Pennsylvania expedition under Linton Satterthwaite.

Chichen Itza: No excavations were carried on. Dr. Morley, on returning

from Copan, devoted the balance of the winter and the spring to final revision of his compendious monograph on the inscriptions of Peten. Mr. Ruppert made studies of the so-called "Toltec" architecture at Chichen.

Miscellaneous: Dr. Alexander Pogo is attacking the problem of the correlation of Maya and Christian chronology from the astronomical viewpoint. J. E. Thompson finished his report on the archaeology of San José, British Honduras, and later visited museums in England and Italy. Under the supervision of F. B. Richardson, the Carnegie Institution is making as complete a file as possible of photographs of Maya sculpture, and is anxious to secure copies of all unpublished photographs of sculptures. Miss Anna Shepard was in Guatemala for two months making technological studies of the pottery from Uaxactun. This large collection is being written up for publication by R. E. Smith.

Historical Research: Mr. France Scholes spent the year in Cambridge working on materials collected by him in past years in the Archives of the Indies at Seville. He was assisted by Miss Eleanor B. Adams and Dr. Robert Chamberlain. The latter went to Guatemala, Honduras, and Chiapas for archive study in the late winter. The archives of Guatemala are proving unexpectedly rich in materials bearing on the Colonial period.

Non-archaeological researches conducted by the Carnegie Institution included ethnological and sociological studies by Drs. Robert Redfield and Sol Tax in the Guatemalan Highlands, linguistic researches by Dr. Manuel Andrade in the highlands, agronomic studies by J. E. Kempton and Raymond Stadelman, anthropometric and statistic studies in Yucatan by Dr. Steggerda, and studies on the distribution of Maya groups in the sixteenth century by Ralph Roys. (*J.A.M.*)

Attention Affiliates!

Please notify the Secretary-Treasurer immediately upon changing your address.

A limited number of copies of the Indianapolis Conference report (1935) are available at fifty cents each. This price covers the cost of printing and mailing. While they last, copies may be obtained by addressing Dr. Carl E. Guthe, University Museums Building, Ann Arbor, Michigan.

BOOK REVIEWS

Evidence of Recent Movements along Faults of Balcones System in Central Texas. FRANK BRYAN. (Bulletin of the American Association of Petroleum Geologists, Vol. 20, No. 10, pp. 1357–1371, October, 1936.)

Although intended primarily for oil geologists, this discussion of recent movements along fault lines in Central Texas draws attention to some facts and considerations of great interest to archaeologists and physiographers. The Cretaceous and Tertiary beds of Central Texas and some neighboring regions show a pronounced horst and graben structure. The bulk of the faulting responsible for this structure seems to post-date the Tertiary, and there is interesting evidence that much faulting may have taken place during the Post-Pleistocene or Recent. Many of the faults are still active today, as attested by minor local earthquakes and, for example, repeated breaks in a pipeline where it crosses one of the faults.

In this general area several buried middens and culture horizons have been discovered, some or all of which seem to have been affected by these recent movements along fault lines. The most striking case is that of the J. V. Mason buried midden five miles north of Waco, Texas, where three horizons of midden material, separated by barren, stratified silts, probably of lacustrine origin, are exposed in a 25-foot cut bank of the Brazos River. A fourth culture horizon lies nearly entirely below low water level of the river. All of this material has been faulted down against undisturbed marls of Cretaceous age. As even the topmost midden material is involved in the faulting, it is evident that the movements are likely to have taken place in quite recent time. From statements made elsewhere in the article we may infer that the stratified silts are due to the former existence of a small lake on the down-thrown side of the fault. The actual existence of the fault seems to be corroborated by the occurrence of a typical fault-fissure spring at the contact. Thus changes in sedimentation due to changes in the behavior of the Brazos River, entirely independent of local faulting, seem to be ruled out. In one or two of the other cases, however, the evidence for recent faulting as presented in the article is not quite as clear, and judging by the data as given, might also be explained without recourse to movements along fault lines. On the other hand, it seems quite well established that all the middens mentioned occur near and on the down-thrown side of faults.

In one instance gravels were involved which prior to the discovery of buried midden material had been "quickly and easily" classified as Pleistocene. The author states that "the presence of man-made implements in these gravels has complicated this former easy correlation." It would be very interesting to know exactly on what grounds these gravels formerly were so easily identified as Pleistocene, and not as Post-Pleistocene. There still are many geologists who are inclined, without any further ado, to put all important Post-Pliocene gravel deposits in the Pleistocene. Was that the case here?

While there is little doubt that many of these faults have been active in recent times, and that some are active still, it is a much more difficult problem to ascertain about how long ago some of the faulting occurred. It is here that archaeology may be of some assistance to geology, if it should prove possible to make valid comparisons of artifacts from the Texas middens with artifacts from the areas for which a tree-ring chronology has been established.

Upon several occasions the reviewer has drawn attention to the value of close coöperation in detail work between archaeologists and physiographers and geologists. This interesting article is an excellent example of how archaeology even may contribute to such an apparently remote field as oil geology.

W. VAN ROYEN

History of Hawikuh, New Mexico: One of the So-Called Cities of Cíbola. FREDERICK WEBB HODGE. (Publications of the Frederick Webb Hodge Anniversary Publication Fund, Vol. 1, Los Angeles, 1937.)

There are those who may protest the limitations our author has placed upon the title of this, his latest work. For the *History of Hawikuh* is, in reality, a history only of Hawikuh's closing century and a half rather than a comprehensive account tracing its origin, development, and decline. In other words, we have here a reëxamination of 16th and 17th century Spanish documents or such portions of them as refer to the "so-called Cities of Cíbola," and especially Hawikuh. The pre-Spanish phase, or prehistory of the pueblo, as revealed by the author's excavations of 1917–1923, is reserved for the future.

With a sympathetic understanding of economic problems and social organizations in modern Zuñi; with an experience in Southwestern anthropology that bridges the past half century (however impossible this may seem to all who know him); with an unsurpassed knowledge of those Spanish relations which pertain to the conquest of the Southwest, Dr. Hodge was admirably prepared to write the volume before us. His lucid sentences, supported by frequent quotations, present the varying misfortunes of Hawikuh from the approach of Fray Marcos de Niza in 1539, and the capture by Coronado a year later, to the Apache attacks of 1672 which hastened, if they did not actually cause, final abandonment. The *History of Hawikuh* seemingly is the last word that need be written on the subject.

But the book is more than the chronicle of a single pueblo. It is a summary, compiled from contemporary records, of the discovery, subjugation, and supposed Christianization of the Zuñi villages. Our author shows how an Old World legend—seven cities on the mythical Atlantic island of Antillia—was brought to the New World and, quite by chance, came a few years later to be identified with certain mysterious towns in the unexplored north country whose alleged riches were greatly magnified by an Indian slave, the son of a trader in parrot feathers, thus to please his master, the Governor. Chance again willed that this identification seemingly should be confirmed when Cabeza de

Vaca and his three companions arrived in Mexico, after incredible adventures, to repeat stories they had heard of powerful cities, four and five stories high, beyond the northern deserts. Especially welcome to those seeking a second Peru, these tales found further substantiation in the reports of two priests who had been sent north to convert the natives. Thus, in 1538 Fray Marcos de Niza was commissioned by the viceroy to discover these walled cities. Myth became reality when the Franciscan reported to Mendoza late in August, 1539; as Hodge says, "the legendary Seven Cities of ancient times had now become translated and localized in the 'Seven Cities of Cíbola.'" (p. 12.)

Readers of AMERICAN ANTIQUITY are more or less acquainted with accounts of the Coronado Expedition of 1540–1542 and those following; but few will have had the interest and patience to attempt solution of the many riddles present in those accounts. It is here, in the opinion of this reviewer, that the *History of Hawikuh* justifies itself and brings added fame to its author; for Hodge sifts and winnows all the confusing and conflicting statements of various individuals, often blinded by bitterness, and molds the kernels of fact into a readable, convincing narrative. He traces for us not only the route of Fray Marcos, branded as a liar by Castañeda and others with less cause for biased judgement, but also sketches the advance of Coronado and his army to their disillusionment after the fall of Hawikuh. He introduces the later expeditions, military and missionary, that reached the Zuñi settlements, and brings order to the multiplicity of names by which those expeditions, and their narrators, have designated the several villages. (The synonymy lists thirty-four names applied to Hawikuh alone.) Hawikuh is identified as the Zuñi town which Fray Marcos claimed to have seen and the one where the negro, Estevan, was killed (p. 24); the "Seven Cities of Cíbola" are indubitably the Zuñi towns of the 16th and 17th centuries (p. 46).

Hodge concludes there were only six Zuñi pueblos in Coronado's time (p. 57). If Spaniards of the period thought of them as seven it was because the ancient legend was still fixed in their minds; they were driven by "a kind of septenary complex, so to speak" (p. 28), visioning seven cities wherever they hoped to find gold. Trails well travelled led from Culiacán north to the Pima settlements and thence both to the Zuñi and Hopi pueblos; the Indians who guided the successive Spanish expeditions had become familiar with those trails while engaged in intertribal trade, which obviously existed on a much larger scale than is generally believed.

It is pleasing to note that the *History of Hawikuh* appears as the first volume of the Frederick Webb Hodge Anniversary Fund, created to commemorate our author's first fifty years in American anthropology. Let us hope the volumes next to follow will present the prehistory of Hawikuh, a subject all students of Southwestern archaeology have awaited with mounting interest.

NEIL M. JUDD.

Lowry Ruin in Southwestern Colorado with reports of *Masonry of Lowry Ruin and of the Southwest*, LAWRENCE ROYS; *Skeletal Material from the Lowry Area*, GERHARDT VON BONIN). PAUL S. MARTIN. (Anthropological Series, Field Museum of Natural History, Volume XXIII, Number 1, 4 maps, 54 text figures, 112 plates, Chicago, 1936.)

This report by Dr. Martin and collaborators is the outgrowth of four seasons digging in the Lowry ruin located in the southwestern corner of Colorado, near Ackmen. The first five chapters deal descriptively with the ruin and the materials therefrom, Chapter VI is devoted to an enlightening discussion of masonry by Mr. Roys, and Chapter VII, by Dr. von Bonin, is a careful analysis of the skeletal remains found in the Lowry ruin and neighboring area. The concluding chapter, entitled Synthesis, sets forth Dr. Martin's ideas of the internal growth of the Lowry pueblo, population, architectural knowledge, masonry classification, general comparisons, and conclusions.

One of the first requirements of an archaeological treatise: adequate illustrations, is admirably filled by this report. Material culture and ruin views are reproduced by collotype, a process which brings out detail whether in architecture or pottery, about as perfectly as can be wished. In some of the general views the impression is gained of a somewhat too assiduous use of the color filter which has over-corrected to the point where the subject matter is secondary to cloud effects, but this appears so infrequently that it does not detract materially from the illustrations as a whole. Maps and text figures are not encumbered with useless details, yet they omit no essentials.

With concise, topically headed descriptions and an index, any desired subject matter can be found without wading through an interminable amount of text. As such, the report becomes useful at once as a handy reference work for the archaeology of an area which still has a very limited bibliography yet is rich in antiquities. The tedium of reading an archaeological report is relieved by tabulation of much of the metrical data, a practice which should be more generally adopted.

Another keynote struck by this report is collaboration, a tendency which is becoming more and more evident with the appearance of each new monograph. This, in fact, submits materials and technical problems clinically to the minds best equipped to grapple with them. The net results of our studies can only gain from such a procedure.

The Lowry pueblo, a three-storied fifty-room village, is the northernmost of the Chaco-like pueblos yet excavated. Chacoan features were manifested in the pottery, masonry, two classes of kivas, and other architectural details, all contributed from a southern focus; yet these were not the only elements as there was an evident mingling with an indigenous culture which later reached its peak in the cliff ruins of the Mesa Verde. Combined, these conditions served to make the excavation of the Lowry ruin alluring, for, on the one hand, something was to be learned of the Chacoan culture in a marginal area and, on the

other hand, the effects of its intermixture with another group could be studied. On both of these problems our knowledge has definitely been extended.

The Lowry ruin was not rich in material culture as some Southwestern ruins go; but it yielded enough of the every day—and therefore significant—tools and utensils to give substance to Martin's study. Pottery receives full attention, but not to the neglect of stone and bone. The stratigraphic work in Lowry, not only in the rubbish but in the rooms as well, commands respect, and the worth of this care in excavations is shown by the results—a fortification of ceramic trends by tabulations and charts. The dominant pottery at Lowry was Mancos Black-on-white, a northern pottery heavily impressed with southern, or Chacoan, influences.

Combining all of his chronological evidence, derived from tree rings, stratigraphy, wall abutments, and the cross-identification of materials, Martin was able to say that the pueblo was started in the 11th century and was abandoned after not more than 150 fitful years, during which the structure was modified no less than six or seven times and several times deserted and reoccupied. From this we learn a fact as to change which, prior to tree-ring contributions, was sadly misinterpreted. Martin states that before receiving the tree-ring dates from Lowry he felt its history might easily extend through three or four centuries, an estimate which was later boiled down to a century and a half at the most. We see not only that large structures were built and underwent many changes within a short period of time, but that internal cultural changes took place as well. This has been demonstrated in other ruins and it must be concluded that far too much time has generally been allowed for Pueblo cultural advancement, particularly after 1000 A.D.

It also becomes evident that the residents of villages like Lowry were continually remodelling portions of their building for reasons which are none too clear today. In the case of Lowry, however, a satisfying explanation is found in the presence of a Great Kiva which was built early in the history of the village and, as the evidence shows, was used right down to the final days of occupancy. This structure, it is believed, was the attraction which drew increments of the population back to the main pueblo who, had left for reasons of "group repressions and inhibitions."

Mr. Roys, who made an intense objective study of Lowry masonry, found that the dearth of comparative data was so complete that the worth of his work was practically restricted to that ruin. He rightly voices a need for similar detailed masonry studies in other areas, a plea which can be expanded to include such items as stone work generally, bone, and shell.

Lowry masonry was classified as (a) Chaco-like consisting of untooled tabular stones laid up in courses in abundant mud mortar, spalled to prevent the mortar from squeezing out; (b) non-Chaco, consisting of irregular stones with exposed surfaces sometimes tooled, laid up non-coursed in a stone-to-stone contact system, the mud mortar serving chiefly as a filler of the voids between stones, the spalls functioning either as props for the stones or "spreaders" in

the mortar; and (c) intermediate, embodying the characteristics of the preceding two types. Chaco-like masonry was used in the Great Kiva and room nucleus, and was, therefore, the oldest type of the three. Non-Chaco masonry was found in the late additions and resembles the masonry of some of the Mesa Verde ruins. The intermediate style contributed nothing to the masonry sequence. Masonry confirms, in the main, the suggestions of a cultural blend at Lowry seen notably in the pottery.

Mr. Roys' study resulted not only in helping to solve the structural history of Lowry but it suggested to him certain possible trends in masonry evolution which he sets forth. Whether these are right or wrong can only be determined after a large body of facts, collected on a basis comparable with his, has been brought together. Certain it is that anyone with a masonry problem before him will profit by reading Mr. Roys' section of the Lowry report.

In the analysis of the skeletal remains Dr. von Bonin was forced to combine a small series dug by him in 1930 in mounds near Lowry and the Lowry material, totalling thirteen skulls and assorted long bones. This pooling of variously collected material to increase the sample size was justified statistically. After a detailed presentation of metric data and a comparison with American and foreign series, it was concluded that the Lowry residents "In their long bones, as well as in their skulls. . . . are closely akin to the population of Pecos Pueblo. . . ." The amount of space devoted to descriptive data (forty-eight pages including appendix), matched against conclusions (one page), illustrates how fully physical anthropology in the Pueblo area is still in the fact-finding stage. The innumerable excavations here have netted only a few adequate accounts of the skeletal remains and, although his sample was small, Dr. von Bonin adds significantly to this neglected chapter in Southwestern studies.

In accounting for the ingredients which went into the Lowry village, Martin recognizes strong southern elements, Chacoan by name, but which were ultimately derived from the Little Colorado-Puerco area. In this extreme southern placement of the source of Chaco elements some investigators will probably disagree; but it is a view which becomes more plausible with each excavation. One justification for this idea, not so stated in this report however, is rooted deeply in an early contact of the Anasazi with the Mogollon Culture, which the evidence shows to have been strong in the Little Colorado-Puerco district.

The Lowry excavations have given us a very readable report, notable chiefly for rendering a picture of a village lying well beyond the customarily accepted range of its culture.

EMIL W. HAURY

Excavations at the Leary Indian Village and Burial Site, Richardson County, Nebraska. A. T. HILL and WALDO R. WEDEL. (Nebraska History Magazine, Vol. 17, No. 1, pp. 3–73, 4 figs. including map, 10 plates, Lincoln, 1936.)

Certain facts contribute to the importance and timeliness of this report: (1) the present study is the first certain and detailed revelation of a culture

complex markedly different from any hitherto recorded for the Central Plains region west of the Missouri River, a culture which, moreover, according to the authors' belief, exerted much influence on culture growth and change westward in the area in very early historic times; (2) analysis of traits show the site to belong to the Oneota Aspect of the Upper Mississippi, an aspect widely distributed in Wisconsin, Illinois, Minnesota, Iowa, and Missouri and still awaiting that final placing in the Mississippi Valley scheme of things which this study will help to make; (3) the paper is one of the best reports we have on a single site in the Middle West and contains in addition certain discussions which possess wide interest. These last will be mentioned in the following review.

The Leary site, in the literature a number of times beginning with the Journal of Captain William Clark (1804), is conspicuously located in the southeastern corner of Nebraska on the right bank of the Great Nemaha, four miles southeast of Rulo and only a mile and a half from the junction of the Nemaha with the Missouri. It touches the Kansas line on the south. Like Oneota sites elsewhere it is large and open, covering 125 or more acres of terrace, has long been under cultivation, and is abundantly productive of cultural remains. Some mounds on a hundred-foot elevation to the east of the site, noted by Clark and others, could not be examined on account of the objections of the Ioway Indians, who have been resident here for a hundred years and have used this high ground for burials of their own people.

On the basis of a surface-sherd collection made during his survey from 1912–1914, Dr. F. H. Sterns recognized the "Nemaha camp site" as distinct from the Rectangular Earth Lodge Culture of eastern Nebraska, and suggested that it was a Kansa site of almost historic date. Solely on the basis of Ioway tradition, apparently, Gerard Fowke in 1922 ascribed the site to the Pawnee. Basing his judgment on material examined from the site and brief statements of evidence recently found in Iowa, William Duncan Strong in his *Introduction to Nebraska Archeology* (1935, p. 288) suggests "the possibility that the true Oneota culture is represented in the shell-tempered and roughly incised pottery of the Rulo site in extreme southeastern Nebraska . . ." Abundant evidence of the correctness of this judgment was obtained by Hill, Wedel, and party during their excavations carried out from June 5–24, 1935, and minutely described in the present report.

The trait-by-trait agreement with the Oneota Aspect is much more complete than any published summary of Oneota traits would indicate. In their Table III (p. 70f.) Hill and Wedel juxtapose the traits found at Leary with traits of the Iowa Oneota as listed by the writer in two papers of a popular type, intended to present only the chief diagnostic features (*Prehistoric Man In Iowa*, The Palimpsest, June, 1927, and *Some Methods and Results of the Iowa Archeological Survey*, The Wisconsin Archeologist, N.S., Vol. 8, No. 4, 1929). Where in nine cases "no data" stands in the Oneota column, materials gathered

in Iowa actually show entire agreement with Leary. In fact the Leary site produced one trait only unknown to the Iowa Oneota, and apparently unknown to any Oneota site except the Leary; namely, a definite house type. Persistent and systematic search revealed at Leary a single earthlodge, rather small, twenty by twenty-one feet, with rounded corners and an entrance four by fifteen, which was evidently occupied by the people who left the abundant village remains. As this example remained unique in the excavations, however, the authors are constrained to put under the house caption in their table: "Earthlodge rare; probably perishable pole and bark structures." At present this is the tentative conclusion elsewhere. Further, as clear evidence of inclusive copper, brass, iron, and glass objects was not found at Leary, the authors are inclined to regard a small copper cone found in a cache pit under the floor of the house as probably intrusive. This may well be inclusive, however, as the Oneota did possess a small amount of their own copper. Thus the identity of the pre-contact Leary site with the Oneota is as perfect as a comparison can well show. A method of ceramic treatment found at Leary, the vertical bisection of pottery vessels, is interesting and, so far as the writer knows, unique for the area. That a number of Oneota traits not found at Leary are known elsewhere, and that a few of the sites to the east are at least protohistoric are facts known to and recognized by the authors.

As the authors refer (p. 40 and p. 67f.) to a number of sites in eastern Nebraska and the northeastern quarter of Kansas that have produced Oneota-like sherds, in addition to several other Oneota traits, the conviction is strengthened that Mid-Western archaeology is not only warm on the trail of the Chiwere Sioux, but very likely on that of the Dhegiha also. In the writer's opinion sites in Iowa and Minnesota, as well as a part of Wisconsin, are almost certainly Ioway and Oto; what Leary is remains to be seen, but it should be said that the pottery is apparently identical with that of the Blue Earth, Minnesota, and the Correctionville, Iowa, foci; that is to say, it is a little richer in decorative design than that of the Big Sioux and Upper Iowa valleys (Blood Run and Orr foci). The identity extends even to the finely notched lips and the inner-rim decorations, features which the authors wrongly suspect (p. 34) may be unique for the Leary site. By the pottery index and on the basis of a possibly not too divinatory reading of an early writer or two, Leary should align with the Oto. This is not the place to detail the argument—and then too, before committing oneself irrevocably, one would like to know the Dhegihan archaeology.

The possibilities opened up by this study of the Oneota extensions to the west of the Missouri River are most alluring and promising. Two sentences must be quoted (Summary and Conclusions, p. 68): "We hazard the guess that, when the Oneota culture has been more extensively investigated in its western manifestations, a flood of light will be thrown on the still more or less perplexing problem of culture growth and change in the Central Plains area in very early historic times. If the Oneota proves to be a Siouan pattern . . ., then a number

of the problems in this area may further resolve themselves into questions of the interplay of cultures which were borne respectively by peoples of Siouan, Caddoan, and probably one or two other linguistic stocks." The writer believes that the prospects for realization are excellent.

As indicated in my first paragraph, this paper is more than a report of a single site. The treatment of the occurrence of the grooved maul (p. 42 ff.), the hafting of the scapula hoe (p. 54), and the occurrence of socketed antler projectile points (p. 58 ff.) are all of such general interest that they might properly have been made the subjects of separate papers, or at least notes. They do not lend themselves to profitable condensation.

As far as the reviewer knows, there is very little error in the paper, and the proof-reading is all but perfect. The authors will smile when reminded that the carp, if the word is used in its usual meaning, could not have entered into the diet of the pre-contact people at Leary. Mention of a fish recalls the authors' statement to the effect that no bone fishhooks, harpoon heads, or other appliances clearly designed for fishing were found (p. 65). But perhaps the little double-pointed "drill" illustrated on p. 50 would have served nicely as a fish gorge. These are fairly common in the Oneota, especially at Blood Run on the bank of the Big Sioux. Their shape argues against the drill function and suggests a fishhook substitute. Finally, the name Oneota is not as clearly Siouan in its origin as the authors assume it to be (p. 67). It was in use by a Siouan people, the Winnebago, who apparently were not very clear, however, as to its meaning. This suggests the possibility of an origin outside the Siouan group. The story is too long to tell here. The matter of a name is probably interesting and important enough though to justify an appearance in the correspondence section later, when a point or two now resisting explanation shall have become clear.

CHARLES R. KEYES

Archaeology of Santa Marta, Colombia, The Tairona Culture; Part II, Section I: Objects of Stone, Shell, Bone and Metal. J. ALDEN MASON. (Field Museum of Natural History Anthr. Ser., Vol. XX, No. 2, pp. 133–272, Plates LXV–CLXIII, Chicago, 1936.)

The very important excavations in 1922–23 by Mason in Santa Marta are yielding in his reports more information on the archaeology of the Tairona than exists for the whole of the rest of Colombia, including the ethnologically better known Chibchas. In this section Mason deals with artifacts other than pottery, reserving comparative discussion and conclusions for a final section. The inclusion of material in other museums and in private collections makes this survey uniquely comprehensive. Undoubtedly it will be a standard reference book to the archaeology of the region for all time.

Since the factual contents scarcely lend themselves to anticipatory discussion by a reviewer, attention may be drawn to presentation, an important

feature seldom or never mentioned, but of some concern in these days of accumulating material and shrinking budgets. This publication is typical of many, in which authors, not excluding the reviewer, and editors fail to compress text. The ninety-six excellent plates cover the ground so well that printed matter might have been cut nearly fifty percent by rearrangement and omission of measurements and detailed descriptions of illustrated material. Field Museum might profitably drop the cumbersome Roman numbers for plates, thereby saving space and the reader's patience. It is a pity that this extremely important publication should be marred by these small features.

J. Eric Thompson

SOME RECENT PUBLICATIONS

UPPER NORTH AMERICA

Archaeological Field Work (Ohio). Museum Echoes 10, No. 11: 42, Columbus: Ohio State Archaeological and Historical Society, November, 1937.

Baldwin, Gordon C., The Pottery of Kinishba (Arizona). The Kiva 3, No. 1: 1–4, Tucson: Arizona State Museum, October, 1937.

Brand, Donald D., Florence M. Hawley, Frank C. Hibben, et al., Tseh So, a Small House Ruin, Chaco Canyon, New Mexico. University of New Mexico Bulletin, Anthropological Series 2, No. 2, 174 pp., 23 plates, 7 figs., 4 maps, Albuquerque, 1937.

Brown, Charles E., Petroglyphs at the Mouth of the Lemonweir River (Wisconsin). Wisconsin Archeologist, N. S., Vol. 17, No. 4: 75–78, Milwaukee: Wisconsin Archaeological Society, September, 1937.

Burgh, Robert, Mesa Verde Coiled Basketry (Colorado). Mesa Verde Notes 7, No. 2: 7–14, August, 1937.

Bushnell, David I., Jr. Indian Sites below the Falls of the Rappahannock, Virginia. Smithsonian Miscellaneous Collections 96, No. 4: i-vi, 1–66, illustrated, Washington 1937.

Casey, T. Alan, Rheumatic Cliff Dwellers (Colorado). Mesa Verde Notes 7, No. 2: 4–6, August, 1937.

Chawner, W. D., Geology of Catahoula and Concordia Parishes; Indian Mounds (Louisiana). Dept. of Conservation, Louisiana Geological Survey, Geological Bulletin 9: 13–14, New Orleans, 1936.

Collins, Henry B., Jr. Culture Migrations and Contacts in the Bering Sea Region. American Anthropologist, N. S., Vol. 39, No. 3: 375–384, 1937.

Fischer-Møller, K., Skeletal Remains of the Central Eskimos. Report, Fifth Thule Expedition 3, No. 1, Copenhagen, 1937.

Gaumer, Alfred E., Basketmaker Caves in Desolation Cañon, Green River, Utah. The Masterkey 11, No. 5: 160–165, Los Angeles: Southwest Museum, September, 1937.

Geist, Otto W. and Froelich G. Rainey, Archaeological Excavations at Kukulik, St. Lawrence Island, Alaska (with reports on Geology and Geography by R. Snodgrass; Mammals, Dog Skulls, and Birds by O. J. Murie; and Mollusks by H. J. Boekelman). University of Alaska Miscellaneous Publications 2: i-xx, 1–392, 79 plates, 60 figs., 8 maps, Washington, 1936.

Greenman, Emerson F., The Younge Site (Michigan). University of Michigan Museum of Anthropology, Occasional Contributions 6: i–xii, 1–172, 33 plates, 9 figs., 10 maps, Ann Arbor, 1937.

Halpin, Robert B., Wood and Juneau County Mound Groups (Wisconsin). Wisconsin Archeologist, N. S., Vol. 17, No. 4: 88–89, Milwaukee: Wisconsin Archeological Society, September, 1937.

Jackson, Earl, Rio Grande Glazes (New Mexico). Southwestern Monuments Monthly Report, August, pp. 156–157, Department of the Interior, National Park Service, 1937.

Mathiassen, Therkel, The Eskimo Archaeology of Julianhaab District. Meddelelser om Grønland 118, No. 1, 141 pp., 4 plates, 60 figs., Copenhagen: C. A. Reitzels Forlag, 1936. Price Kr. 7.

Mathiassen, Therkel, The Former Eskimo Settlements on Frederik VI's Coast. Meddelelser om Grønland 109, No. 2, 58 pp., 28 figs., Copenhagen: C. A. Reitzels Forlag, 1936. Price Kr. 2.50.

Ritchie, William A., A prehistoric Fortified Village Site at Canandaigua, Ontario County, New York. Rochester Museum of Arts and Sciences, Research Records 3, 76 pp., 26 plates, 24 diagrams, 2 figs., Rochester, 1936.

Steward, Julian H., Ecological Aspects of Southwestern Society. Anthropos 32: 87–104, 1937.

Thorne, G. M., The Illinois State Archeological Society. Wisconsin Archeologist, N.S., Vol. 17, No. 4: 90, Milwaukee: Wisconsin Archeological Society, September, 1937.

Tucker, Mary, Books of the Southwest (general bibliography). 105 pp., New York: J. J. Augustin, 1937. Price 75¢.

VanRoyen, William, Prehistoric Droughts in the Central Great Plains (relates to archaeological problems). The Geographical Review 28, No. 4: 637–650, October, 1937.

Walker, Edwin F., Sequence of Prehistoric Material Culture at Molaga Cave. California. The Masterkey 11, No. 6: 210–214, Los Angeles: Southwest Museum, November, 1937.

Watson, Don, A Thousand Year Old Murder Mystery (Colorado). Mesa Verde Notes 7, No. 2: 15–16, August, 1937.

Wheeler, S. M., Prehistoric Miniatures (Nevada). The Masterkey 11, No. 5: 181, Los Angeles: Southwest Museum, September, 1937.

Wheeler, S. M., An Archeological Expedition to Nevada. The Masterkey 11, No. 6: 194–197, Los Angeles: Southwest Museum, November, 1937.

Woods, Carter A., The Levanna (N. Y.) Algonkian Village Site. National Archaeological News 1, No. 6: 22–23, August, 1937.

Wyman, Leland C. Blood Groups of the Ancient Americans. Mesa Verde Notes 7, No. 2: 1–3, August, 1937.

MIDDLE AMERICA

Arpee, Levon H., Bibliographic Notes on the Mayas of Central America. Department of Anthropology, Y.M.C.A. College, Bulletin 2, Chicago, 1937.

Butler, Mary, Piedras Negras Pottery, I — Vessels, II — Figurines, Ornaments, and Miscellaneous Objects. Piedras Negras Preliminary Papers 4, 69 pp. 14 plates, Philadelphia: University Museum, 1935.

Valle, Rafael H., Bibliografia Maya (A–B, C). Boletin Bibliografico de Anthropologia Americana, Instituto Panamericano de Geografia e Historia 1, Nos. 1–2: 1–22; No. 3: 23–50, Mexico, 1937.

SOUTH AMERICA

Guillén, Victor M., Ruinas de Calca. Revista, Instituto Arquelógico del Cusco 1: 18–29, 1936.

Pardo, Luis A., Maquetas Arquitectónicas en el Antiguo Peru. Revista, Instituto Arquelógico del Cusco 1: 6–17, 1936.

Ryden, Stig, Archaeological Researches in the Department of La Candelaria (Argentina). Ethnological Studies 3: 5–329, Gothenburg: Gothenburg Museum, 1936.

EARLY MAN

Campbell, Elizabeth W. C., William H. Campbell, Ernst Antevs, Charles A. Amsden, Joseph A. Barbieri, and Francis D. Bode, The Archaeology of Pleistocene Lake Mohave (California). Southwest Museum Papers 11, 118 pp. 57 plates, 3 figs., Los Angeles, 1937.

Early Man (36 papers presented at International Symposium on Early Man, Philadelphia, 1937; George Grant MacCurdy ed.). Illustrated, Philadelphia: J. B. Lippincott, 1937. Price $5.00.

Jenks, Albert E., Pleistocene Man in Minnesota. xiii, 197 pp., 89 illustrations, Minneapolis: University of Minnesota Press 1936. Prince $7.50.

GENERAL

Boletin Bibliografico de Anthropologia Americana 1, Nos. 1–2: 1–78; No 3: 79–198, Mexico, 1937.

Brown, F. Martin, America's Yesterday. 320 pp., fully illustrated, Philadelphia: J. B. Lippincott, 1937. Price $3.50.